



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

October 15, 2007

Mr. William Wescott  
U. S. Army Corps of Engineers  
Regulatory Field Office  
Post Office Box 1000  
Washington, NC 27889-1000

Dear Sir:

**Subject: Application for Nationwide 23 Permit** for the Replacement of Bridge No. 72 over Cypress Swamp on SR 1804; Halifax County; TIP Project B-4135; Federal Aid Project No. BRZ-1804(2). Debit \$240 from WBS Element 33488.1.1.

Please find enclosed permit drawings and roadway plans for the above referenced project proposed by the North Carolina Department of Transportation (NCDOT). A Programmatic Categorical Exclusion (PCE) was completed for this project on June 14, 2004, and distributed shortly thereafter. Additional copies are available upon request. The NCDOT proposes to replace existing Bridge No. 72 over Cypress Swamp on SR 1804 in Halifax County. The project involves replacement of the existing functionally obsolete and structurally deficient 43-foot bridge and approaches with a new 90-foot bridge and approaches. The new bridge will feature two 11-foot lanes with 3-foot 11-inch offsets. The west approach will be approximately 287 feet long and the east approach will be approximately 287 feet long. Proposed permanent impacts include 0.04 acre of riverine wetland impacts. Traffic will be detoured off-site along surrounding roads during construction.

### **Impacts to Water of the United States**

General Description: The project is located in the Roanoke River Basin (Hydrologic Unit 03010107). A best usage classification of "C" has been assigned to Cypress Swamp [DWQ Index # 23-1]. Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area. Cypress Swamp is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River. Additionally, Cypress Swamp is not listed on the Final 2006 303(d) list of impaired waters due to sedimentation for the Roanoke River Basin, nor does it drain into any Section 303(d) waters within 1.0 mile of the project study area.

Permanent Impacts: As stated above, proposed permanent impacts consist of 0.01 acre of fill and 0.03 acre of mechanized clearing in riverine wetlands. The total amount of proposed impacts to jurisdictional wetlands is 0.04 acre. Additionally, there is 0.01 acre of proposed impacts to surface waters due to roadway fill and an interior bent.

Temporary Impacts: There are no temporary impacts proposed for this project.

**MAILING ADDRESS:**  
NC DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS  
1548 MAIL SERVICE CENTER  
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141  
FAX: 919-733-9794

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

Utility Impacts: No impacts to jurisdictional resources will occur due to relocation of utilities in the project area. Wetland impacts due to the relocation Sprint telephone lines will be avoided by using directional bore techniques.

Bridge Demolition:

The superstructure for Bridge No. 72 is composed of timber flooring on timber joists with timber rails and the substructure consists of timber bulkheads at the end bents with timber piles. All components will allow removal without dropping them into the water. Best Management Practices for Bridge Demolition and Removal will be implemented.

**Avoidance and Minimization**

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures were incorporated as part of the project design. These included:

- To minimize impacts, NCDOT is replacing Bridge No. 72 in place and utilizing an off-site detour.
- The bridge will be lengthened by 47 feet.
- The bridge will be constructed without any temporary access.
- NCDOT is also minimizing impacts to surface waters by utilizing longer spans with fewer bents than the existing bridge.
- 3:1 slopes were used in jurisdictional areas.
- NCDOT will utilize Stream Crossing Guidelines for Anadromous Fish Passage.

The PCE states that NCDOT will adhere to an in-water work moratorium from February 15 to September 30. This moratorium was requested by the NC Division of Marine Fisheries (NCDMF). Cypress Swamp is an inland water and falls under the jurisdiction of the NC Wildlife Resources Commission (NCWRC). NCWRC has requested a moratorium from February 15 to June 15. For this reason, NCDOT will adhere to the February 15 to June 15 moratorium.

**Mitigation**

The proposed project will have permanent impacts to riverine wetlands totaling 0.04 acre and 0.01 acre to surface water. Due to the minimal amount of permanent impacts to jurisdictional resources, NCDOT is not proposing mitigation.

**Federally Protected Species**

The most current listing by the US Fish and Wildlife Service (USFWS) lists three federally protected species for Halifax County. There is no habitat any of the species within the project study area and the biological conclusions are "No Effect".

Common Name	Scientific Name	Status	Habitat	Conclusion
red-cockaded woodpecker	<i>Picoides borealis</i>	E	No	No Effect
Tar River spinymussel	<i>Elliptio steinstansana</i>	E	No	No Effect
dwarf wedgemussel	<i>Alasmidonta heterodon</i>	E	No	No Effect

## Project Schedule

The project has a scheduled let of May 20, 2008 with a review date of April 1, 2008.

## Regulatory Approvals

Section 404 Permit: All aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by Nationwide Permits 23.

Section 401 Permit: We anticipate 401 General Certification number 3632 will apply to this project. The NCDOT will adhere to all standard conditions of the aforementioned certification, and therefore are requesting written concurrence from the North Carolina Department of Environmental and Natural Resources, Division of Water Quality. Therefore, in accordance with 15A NCAC 2H, Section .0500(a), we are providing five copies of this application to the NCDWQ for their review and approval. Authorization to debit the \$240 Permit Application Fee from WBS Element 33388.1.1 is hereby given.

A copy of this permit application will be posted on the NCDOT website at: <http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html>.

If you have any questions or need additional information, please contact Chris Underwood at (919) 715-1451.

Sincerely,



Gregory J. Thorpe, Ph.D., Environmental Management Director  
Project Development and Environmental Analysis

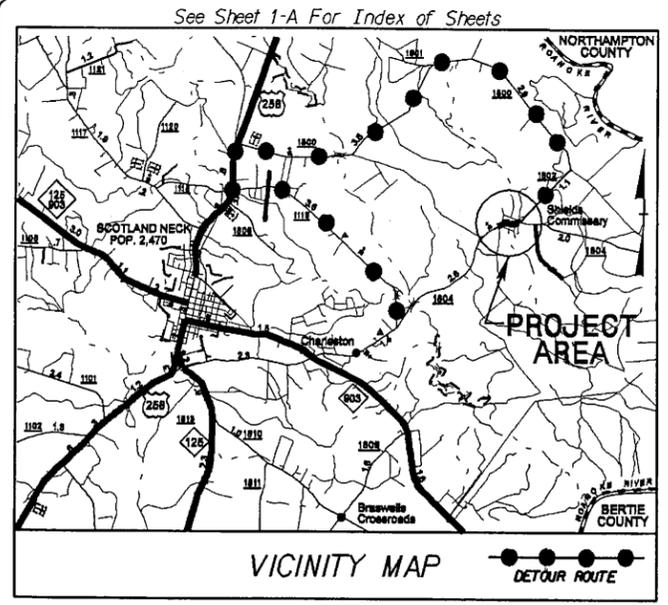
### W/attachment:

Mr. John Hennessy, NCDWQ (2 copies)  
Mr. Travis Wilson, NCWRC  
Mr. Gary Jordan, USFWS  
Mr. Ron Sechler, NMFS  
Mr. Michael Street, NCDMF  
Dr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Victor Barbour, P.E., Project Services Unit  
Mr. Mark Staley, Roadside Environmental  
Mr. Ricky Greene, P.E., Division 4 Engineer  
Mr. Jamie Guerrero, Division 4 Environmental Officer

### W/o attachment

Mr. Scott McLendon, USACE, Wilmington  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Majed Alghandour, P. E., Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Tracy Walter, P.E., PDEA

**TIP PROJECT: B-4135**  
**CONTRACT: C201833**



STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

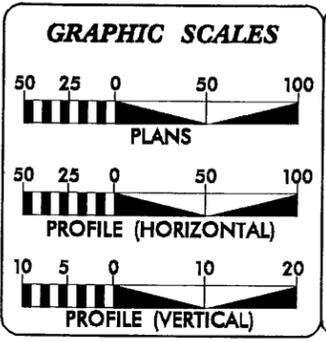
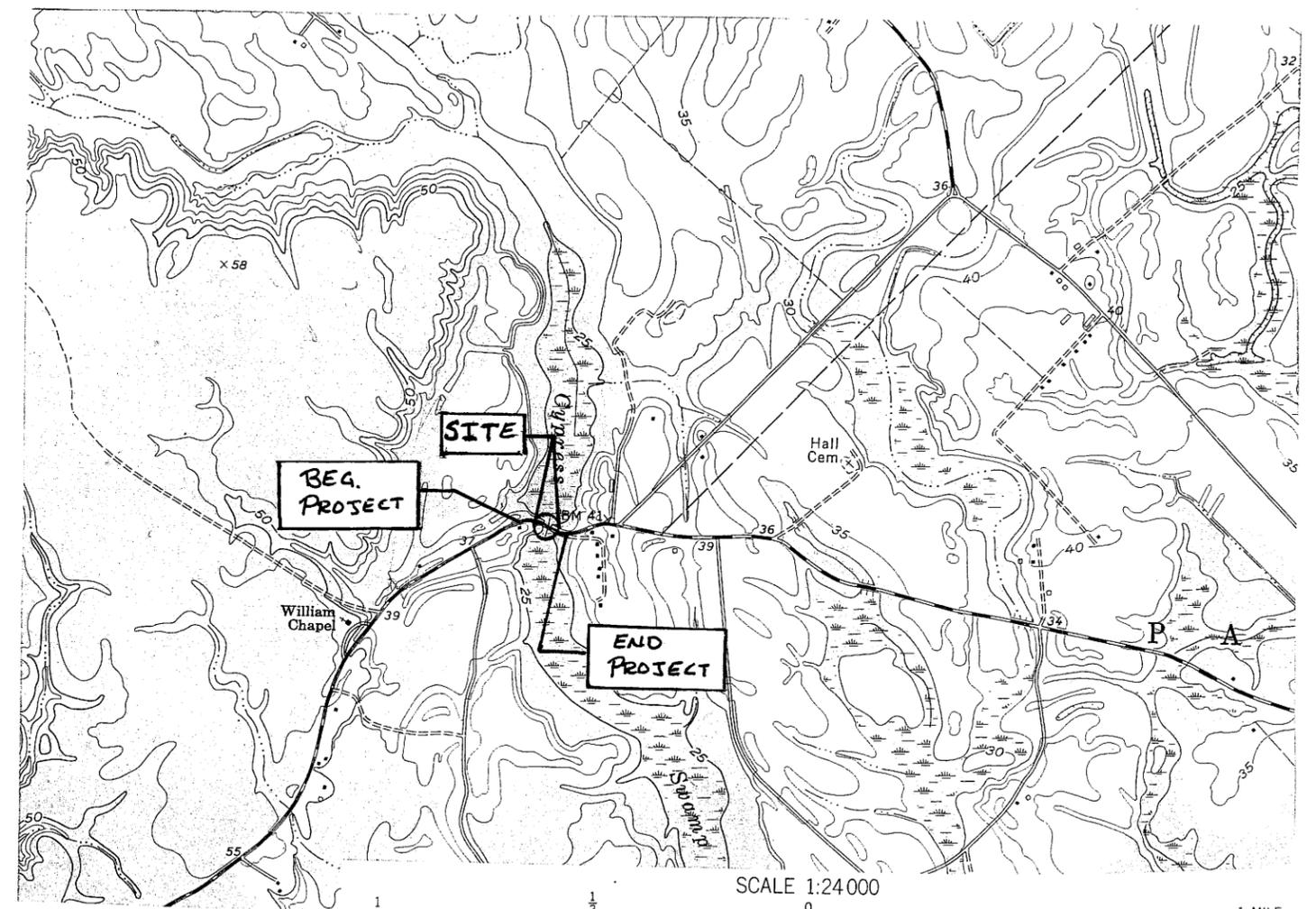
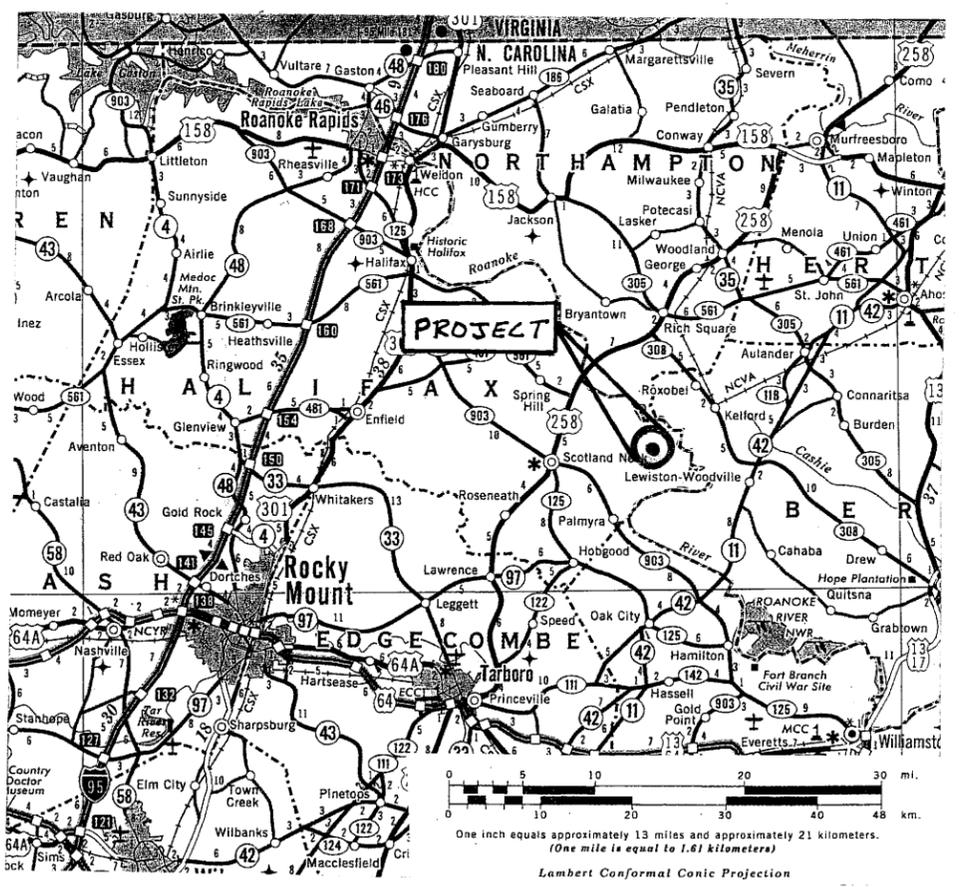
# HALIFAX COUNTY

LOCATION: BRIDGE 72 OVER CYPRESS SWAMP ON SR 1804



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4135	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33488.1.1	BRZ-1804(2)	P. E.	
33488.2.1	BRZ-1804(2)	R/W, UTIL	

Permit Drawing  
 Sheet 1 of 10



**DESIGN DATA**

ADT 2008 =	260
ADT 2028 =	425
DHV =	10 %
D =	60 %
T =	4 % *
V =	60 MPH
FUNC. CLASS. =	LOCAL
* TTST 2%	DUAL 2%

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4135 =	0.09 MILES
LENGTH STRUCTURE TIP PROJECT B-4135 =	0.07 MILES
TOTAL LENGTH OF TIP PROJECT B-4135 =	0.126 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
 1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
 OCTOBER 28, 2005

LETTING DATE:  
 MAY 20, 2008

**HYDRAULICS ENGINEER**

\_\_\_\_\_  
 P.E.

**ROADWAY DESIGN ENGINEER**

\_\_\_\_\_  
 P.E.

**DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA**

\_\_\_\_\_  
 P.E.

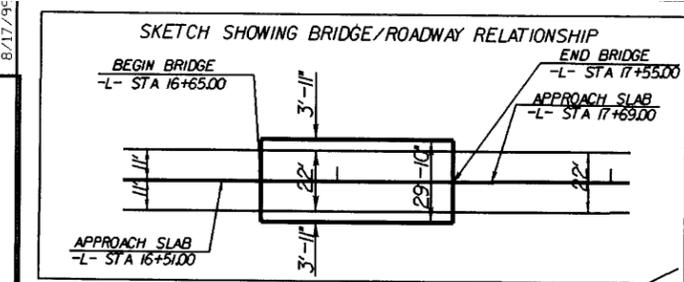
STATE DESIGN ENGINEER

**DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION**

APPROVED \_\_\_\_\_  
 DIVISION ADMINISTRATOR

DATE \_\_\_\_\_

20-JUL-2007 12:41  
 R:\nhyd\qualics\p4135-hyd\pmt-t.sh.dgn  
 blpscomb AT HY221522



-L-

<b>PI Sta 14+30.0</b> $\Delta = 53^\circ 37' 15.9''$ (RT) $D = 15^\circ 04' 40.2''$ $L = 355.63'$ $T = 192.04'$ $R = 380.00'$ $SE = 0.06$ $V = 35$ MPH	<b>PI Sta 19+63.62</b> $\Delta = 44^\circ 46' 43.3''$ (LT) $D = 16^\circ 22' 12.8''$ $L = 273.54'$ $T = 144.18'$ $R = 350.00'$ $SE = 0.06$ $V = 30$ MPH
---	--

\*\* DESIGN EXCEPTION REQUIRED FOR MINIMUM HORIZONTAL CURVE RADIUS AND HORIZONTAL STOPPING SIGHT DISTANCE.

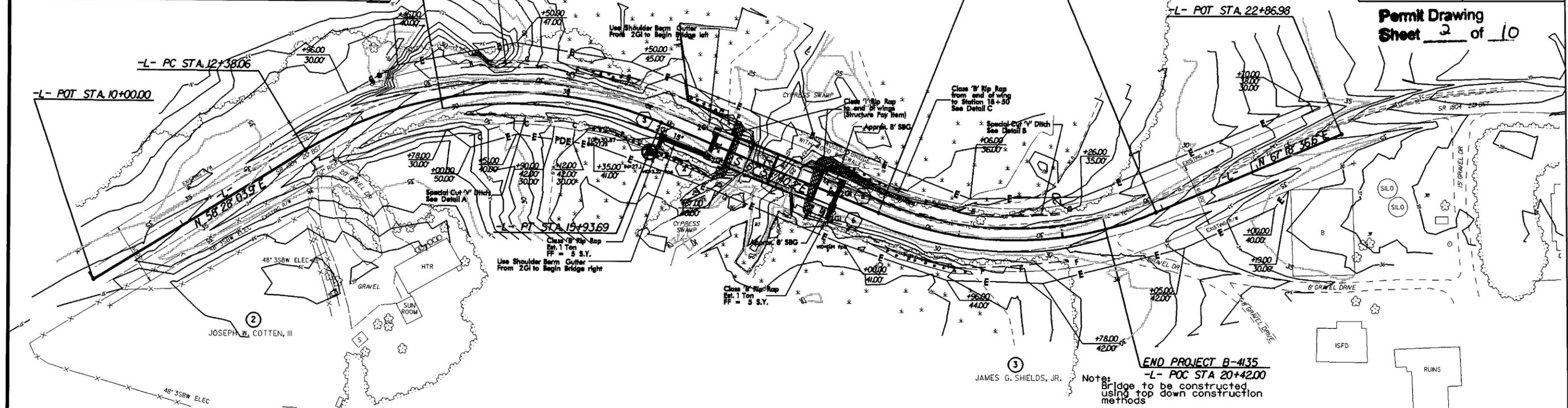
- DENOTES SURFACE WATER IMPACTS PERMANENT
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

ENGLISH

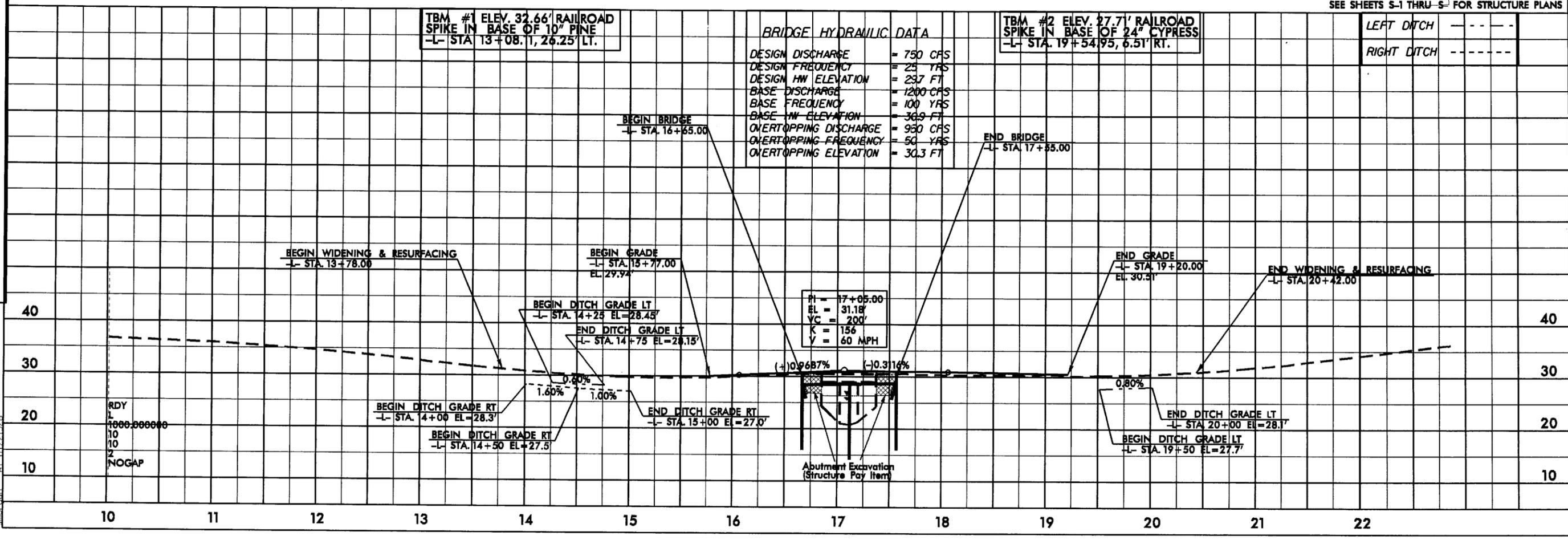
PROJECT REFERENCE NO. B-4135	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

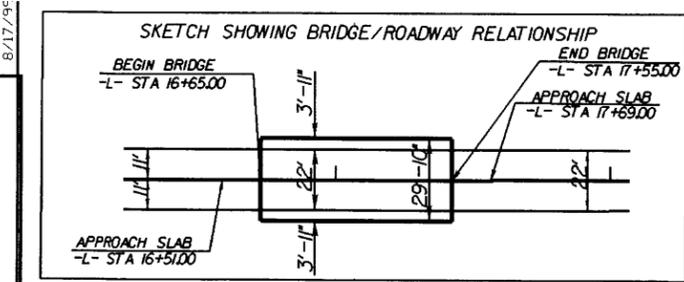
**Permit Drawing**  
Sheet 3 of 10



R/W Rev. - Changed 'Exist. R/W' to '30.00'' on easement flags of Sta. 12+96 LT, 13+00 RT, 14+90 RT, 15+12 RT, 22+19 RT, and 22+70 LT. BCK 7-10-06



21-SEP-2007 09:54  
F:\Hydro\AutoCAD\4135\_Prelim.dwg  
AT: HY 221538  
simon.dgn



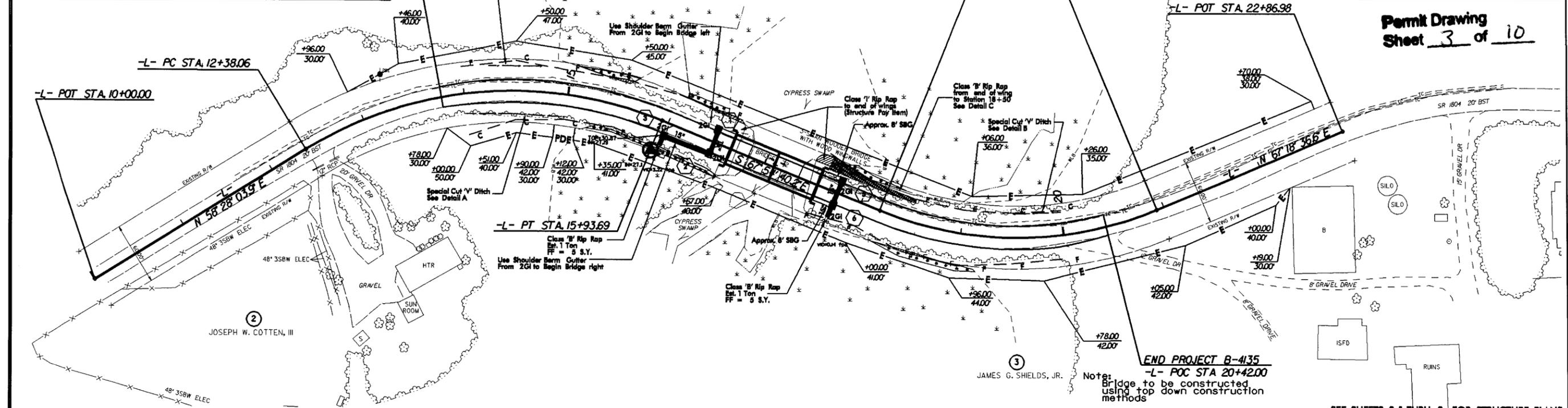
-L-	
PI Sta 14+30.0	PI Sta 19+63.62
$\Delta = 53^\circ 37' 15.9''$ (RT)	$\Delta = 44^\circ 46' 43.3''$ (LT)
$D = 15^\circ 04' 40.2''$	$D = 16^\circ 22' 12.8''$
$L = 355.63'$	$L = 273.54'$
$T = 192.04'$	$T = 144.18'$
$R = 380.00'$	$R = 350.00'$
$SE = 0.06$	$SE = 0.06$
$V = 35$ MPH	$V = 30$ MPH

- DENOTES SURFACE WATER IMPACTS - PERMANENT
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING



PROJECT REFERENCE NO. B-4135	SHEET NO. 4
RDW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

Permit Drawing Sheet 3 of 10



Notes:  
Bridge to be constructed using top down construction methods

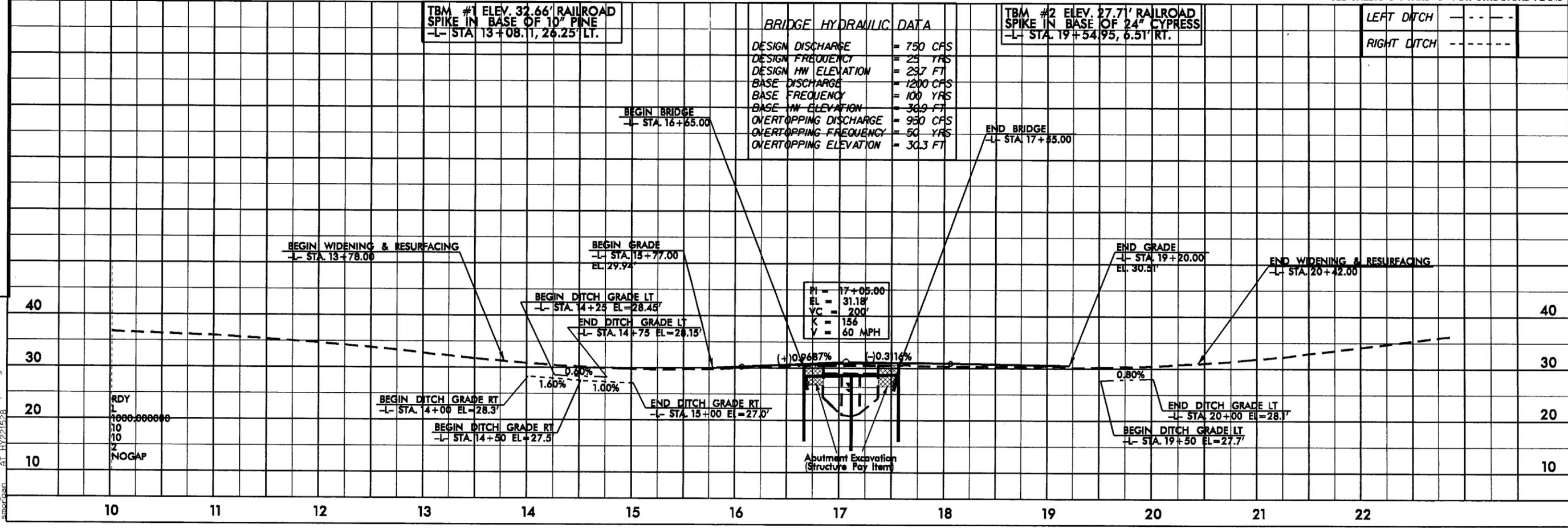
SEE SHEETS S-1 THRU S-5 FOR STRUCTURE PLANS

TBM #1 ELEV. 32.66' RAILROAD SPIKE IN BASE OF 10" PINE  
-L- STA 13+08.1, 26.25' LT.

BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 750 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 29.7 FT
BASE DISCHARGE	= 1200 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 30.9 FT
OVERTOPPING DISCHARGE	= 950 CFS
OVERTOPPING FREQUENCY	= 50 YRS
OVERTOPPING ELEVATION	= 30.3 FT

TBM #2 ELEV. 27.71' RAILROAD SPIKE IN BASE OF 24" CYPRESS  
-L- STA. 19+54.95, 6.51' RT.

LEFT DITCH	---
RIGHT DITCH	---



R/W Rev. - Changed 'Exist. R/W' to '30.00'' on easement flags at Sta. 12+96 LT, 13+00 RT, 14+90 RT, 15+12 RT, 22+19 RT, and 22+70 LT. BCK 7-10-06

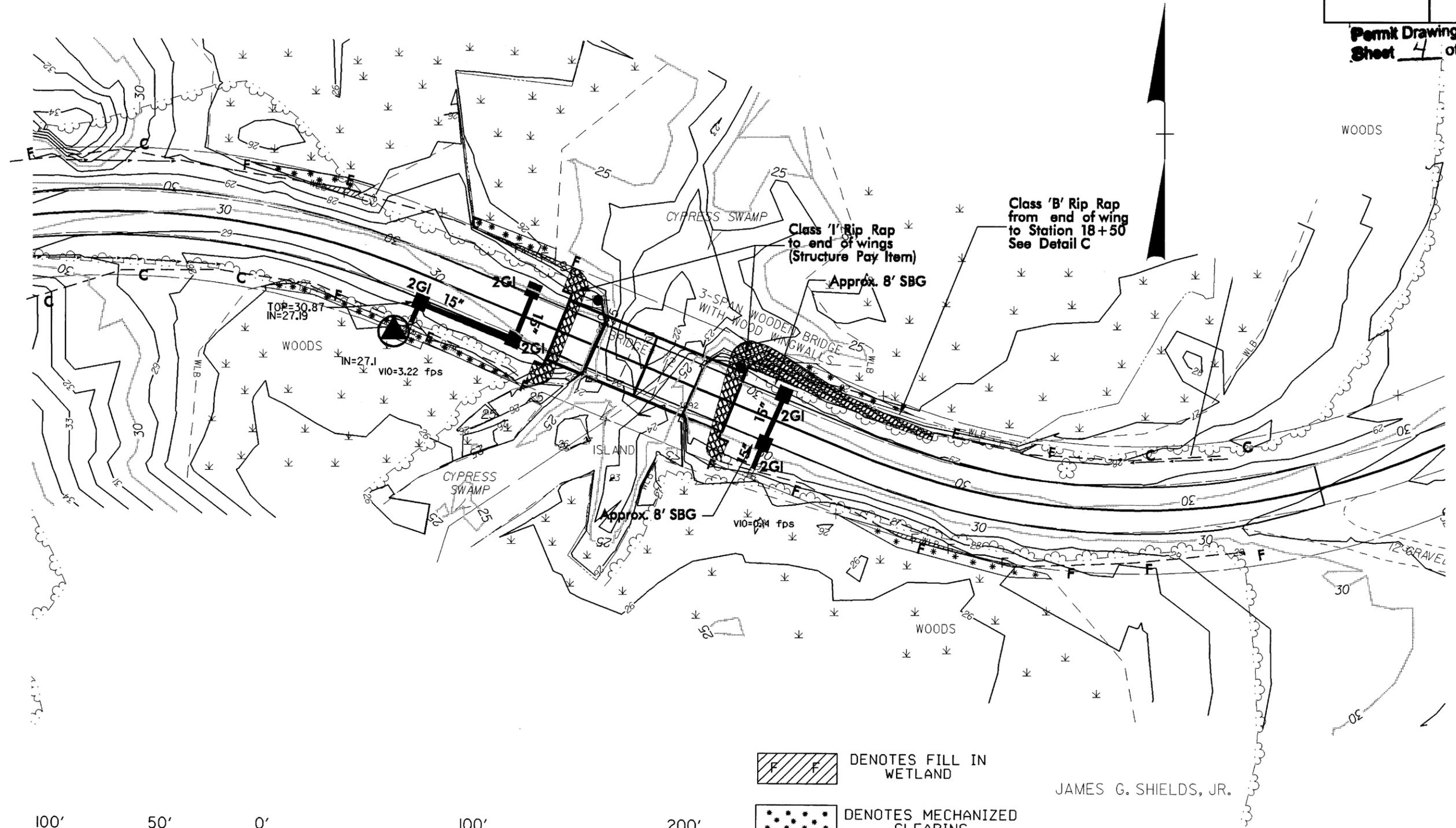
REVISIONS

21-SEP-2007 09:53  
21-SEP-2007 09:53  
A: H:\2121212121\4psh.dgn  
A: H:\2121212121\4psh.dgn

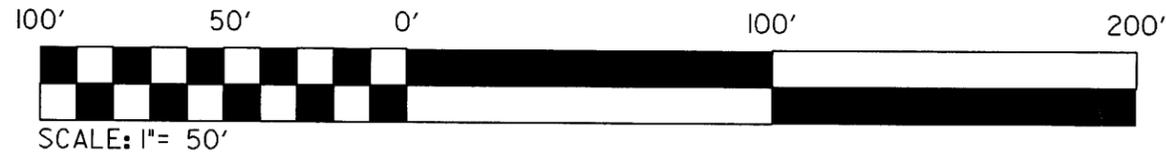
# ENLARGEMENT

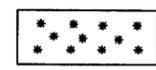
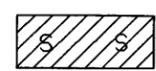
PROJECT REFERENCE NO.		SHEET NO.	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			

Permit Drawing  
Sheet 4 of 10



REVISIONS



-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING
-  DENOTES SURFACE WATER IMPACTS PERMANENT

JAMES G. SHIELDS, JR.

21-SEP-2007 09:59  
 C:\Hydro\2135\pnt-enlar.ge.dgn  
 HYDROLOGICAL

B/17/94

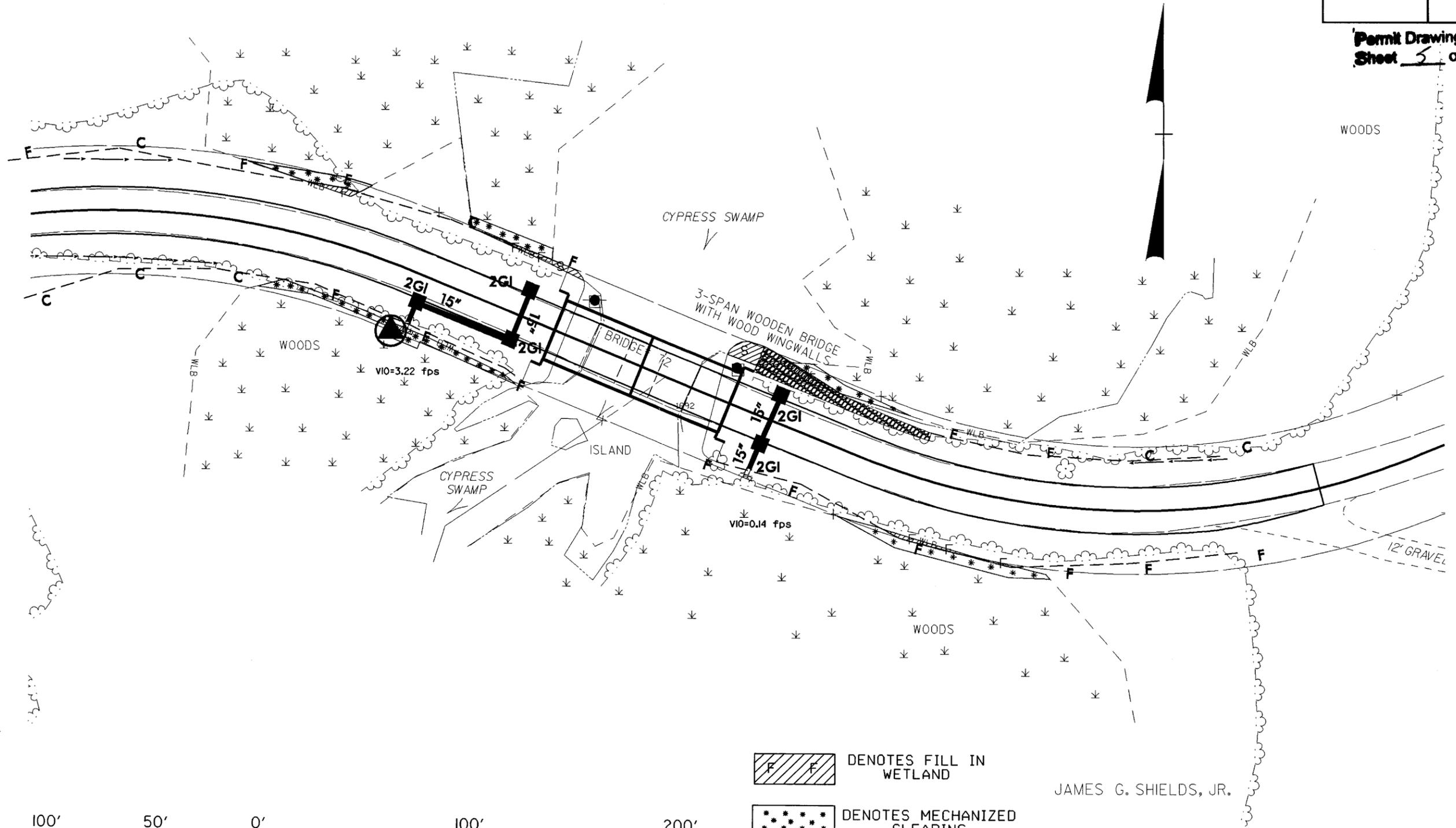
8/17/9

# ENLARGEMENT

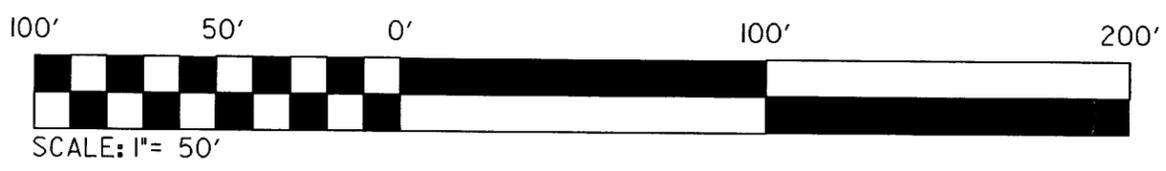
**Note: Rip Rap and contours not shown for clarity.**

PROJECT REFERENCE NO.		SHEET NO.	
<b>ENGLISH</b>			
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing  
Sheet 5 of 10



REVISIONS



- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES SURFACE WATER IMPACTS PERMANENT

JAMES G. SHIELDS, JR.

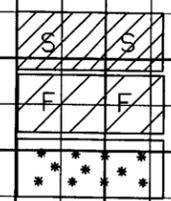
21-SEP-2007 10:01  
P:\Hydro\enlarge.dgn  
BY: JVS



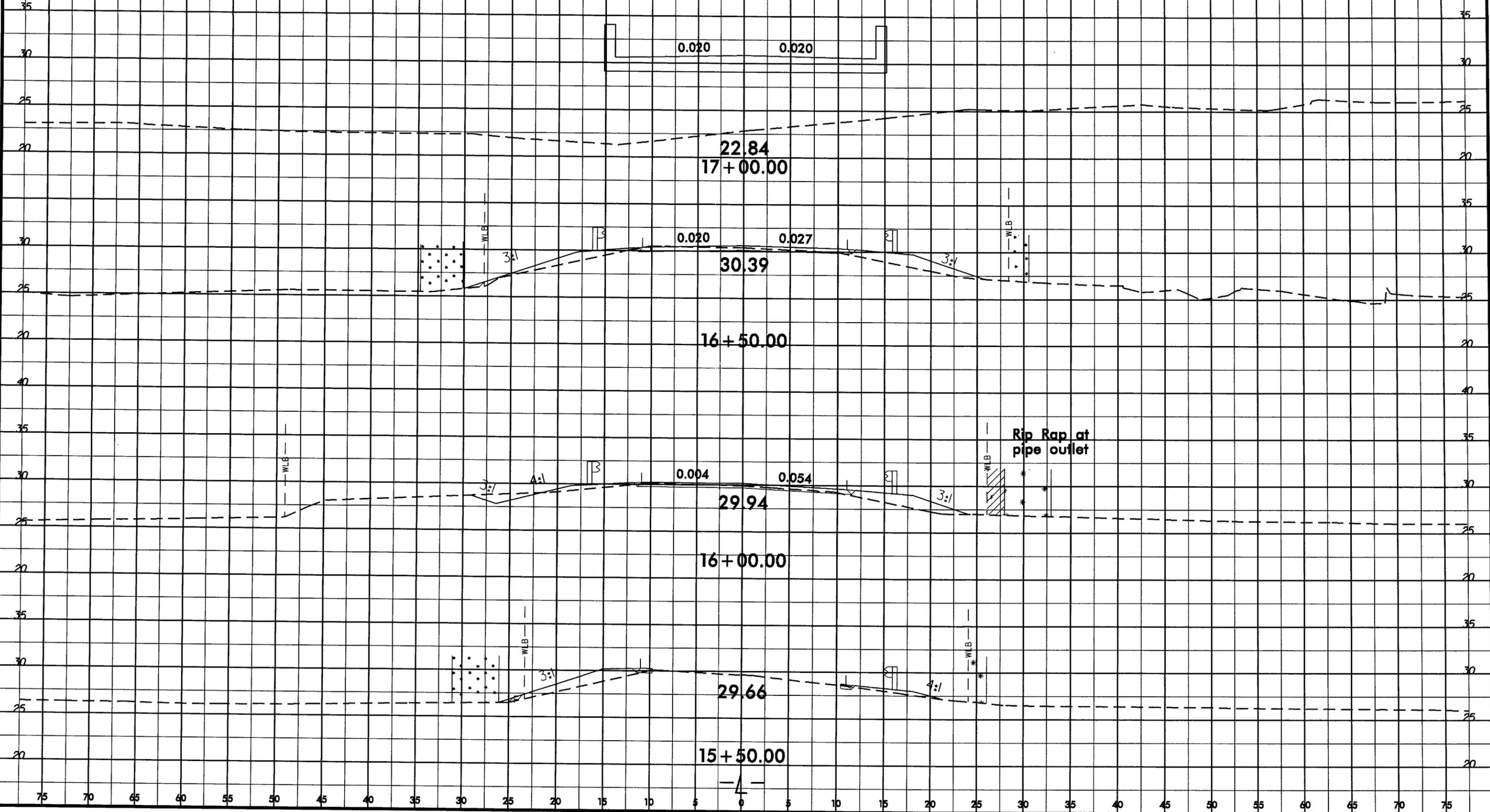
8/23/

0 2.5 5

PROJ. REFERENCE NO. B-4135 SHEET NO. X-2


 DENOTES IMPACTS IN SURFACE WATER  
 DENOTES FILL IN WETLAND  
 DENOTES MECHANIZED CLEARING

Permit Drawing Sheet 7 of 10



21-SEP-2007 10:06  
r:\Hydro\135\135 Hyd cont.xpl.dgn  
smorgan AT HY2135



**Adjacent Property Owners**

Owner/ Business

Joseph W.Cotton.III

Address  
477 Goodspeed rd.  
Virginia Beach VA. 23451

James G. Shields,jr.

3945 Shields Commissary rd.  
Scotland Neck NC. 27874

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
Halifax County  
PROJ - 33488.1.1 (B-4135)  
Bridge no. 72 over Cypress Creek on SR 1804

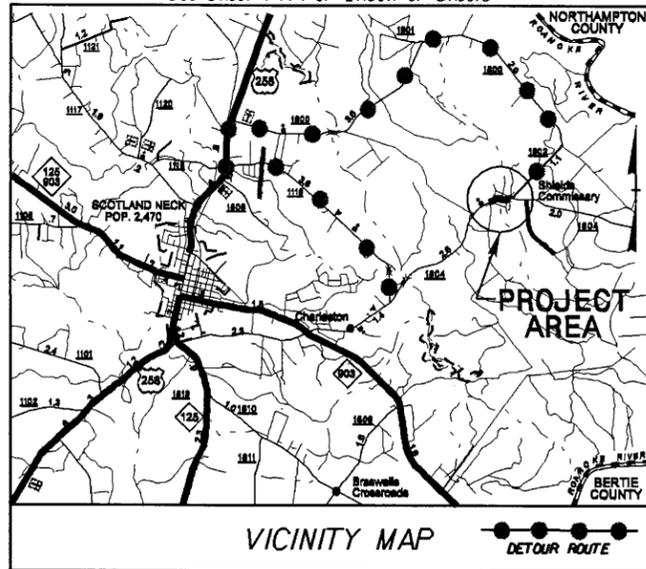
SHEET 7/19/2007

**Permit Drawing**  
**Sheet 9 of 10**



09/08/99

See Sheet 1-A For Index of Sheets



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**HALIFAX COUNTY**

LOCATION: BRIDGE 72 OVER CYPRESS SWAMP ON SR 1804

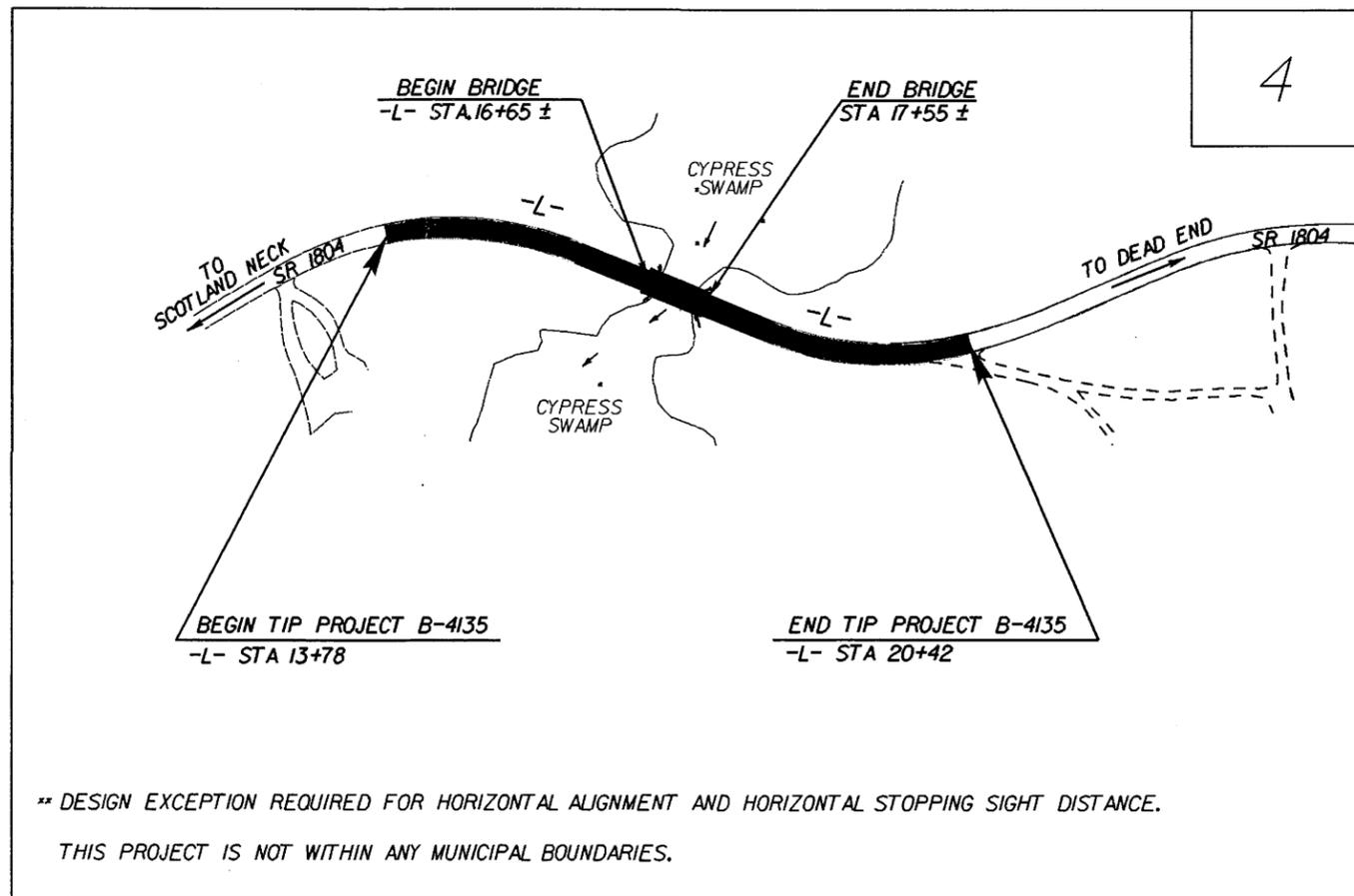
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4135	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33488.1.1	BRZ-1804(2)	P. E.	
33488.2.1	BRZ-1804(2)	R/W UTIL	



TIP PROJECT: B-4135

CONTRACT: C201833



NOTE:  
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

\*\* DESIGN EXCEPTION REQUIRED FOR HORIZONTAL ALIGNMENT AND HORIZONTAL STOPPING SIGHT DISTANCE.  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

25-JUL-2007 09:24 B4135\_rdy\_tsh.dgn  
At: Roadworky P:\2008\B4135\Roadworky\RD223238

<p><b>GRAPHIC SCALES</b></p> <p>50 25 0 50 100 PLANS</p> <p>50 25 0 50 100 PROFILE (HORIZONTAL)</p> <p>10 5 0 10 20 PROFILE (VERTICAL)</p>	<p><b>DESIGN DATA</b></p> <p>ADT 2008 = 260 ADT 2028 = 425 DHV = 10 % D = 60 % T = 4 % * V = 60 MPH FUNC. CLASS. = LOCAL * TTST 2% DUAL 2%</p>	<p><b>PROJECT LENGTH</b></p> <p>LENGTH ROADWAY TIP PROJECT B-4135 = 0.109 MILES LENGTH STRUCTURE TIP PROJECT B-4135 = 0.017 MILES TOTAL LENGTH OF TIP PROJECT B-4135 = 0.126 MILES</p>	<p>Prepared in the Office of: <b>DIVISION OF HIGHWAYS</b> 1000 Birch Ridge Dr., Raleigh NC, 27610</p> <p>2006 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: OCTOBER 28, 2005</p> <p>LETTING DATE: MAY 20, 2008</p> <p>JASON MOORE, PE PROJECT ENGINEER</p> <p>BRYAN KEY, PE PROJECT DESIGN ENGINEER</p>	<p><b>HYDRAULICS ENGINEER</b></p> <p>SIGNATURE: _____ P.E.</p> <p>ROADWAY DESIGN ENGINEER</p> <p>SIGNATURE: _____ P.E.</p>	<p><b>DIVISION OF HIGHWAYS</b> STATE OF NORTH CAROLINA</p> <p>STATE DESIGN ENGINEER P.E.</p> <p>DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION</p> <p>APPROVED DIVISION ADMINISTRATOR DATE</p>
--	--	--	---	--	---

Note: Not to Scale

\*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○
Property Corner	-----
Property Monument	□
Parcel/Sequence Number	⑫③
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing High Quality Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○
Small Mine	⋈
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	-----

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	-----
River Basin Buffer	-----
Flow Arrow	-----
Disappearing Stream	-----
Spring	-----
Swamp Marsh	-----
Proposed Lateral, Tail, Head Ditch	-----
False Sump	-----

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Utility Easement	-----

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Wheel Chair Ramp	-----
Curb Cut for Future Wheel Chair Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	-----
Pavement Removal	-----

### VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	-----
Storm Sewer	-----

### UTILITIES:

POWER:	
Existing Power Pole	-----
Proposed Power Pole	-----
Existing Joint Use Pole	-----
Proposed Joint Use Pole	-----
Power Manhole	-----
Power Line Tower	-----
Power Transformer	-----
U/G Power Cable Hand Hole	-----
H-Frame Pole	-----
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

### TELEPHONE:

Existing Telephone Pole	-----
Proposed Telephone Pole	-----
Telephone Manhole	-----
Telephone Booth	-----
Telephone Pedestal	-----
Telephone Cell Tower	-----
U/G Telephone Cable Hand Hole	-----
Recorded U/G Telephone Cable	-----
Designated U/G Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Recorded U/G Fiber Optics Cable	-----
Designated U/G Fiber Optics Cable (S.U.E.*)	-----

### WATER:

Water Manhole	-----
Water Meter	-----
Water Valve	-----
Water Hydrant	-----
Recorded U/G Water Line	-----
Designated U/G Water Line (S.U.E.*)	-----
Above Ground Water Line	-----

### TV:

TV Satellite Dish	-----
TV Pedestal	-----
TV Tower	-----
U/G TV Cable Hand Hole	-----
Recorded U/G TV Cable	-----
Designated U/G TV Cable (S.U.E.*)	-----
Recorded U/G Fiber Optic Cable	-----
Designated U/G Fiber Optic Cable (S.U.E.*)	-----

### GAS:

Gas Valve	-----
Gas Meter	-----
Recorded U/G Gas Line	-----
Designated U/G Gas Line (S.U.E.*)	-----
Above Ground Gas Line	-----

### SANITARY SEWER:

Sanitary Sewer Manhole	-----
Sanitary Sewer Cleanout	-----
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
Recorded SS Forced Main Line	-----
Designated SS Forced Main Line (S.U.E.*)	-----

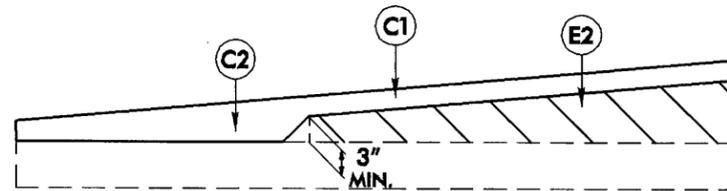
### MISCELLANEOUS:

Utility Pole	-----
Utility Pole with Base	-----
Utility Located Object	-----
Utility Traffic Signal Box	-----
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	-----
AG Tank; Water, Gas, Oil	-----
U/G Test Hole (S.U.E.*)	-----
Abandoned According to Utility Records	-----
End of Information	-----

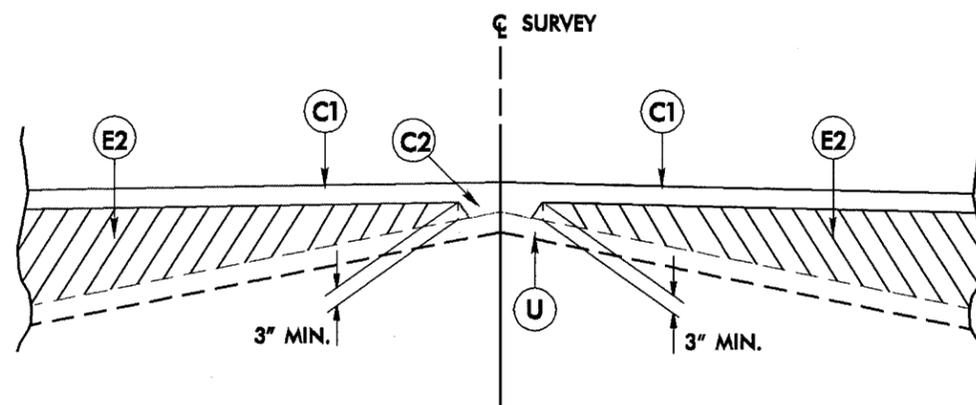
PROJECT REFERENCE NO. B-4135		SHEET NO. 2	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			

PAVEMENT SCHEDULE			
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	T	EARTH MATERIAL.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1 1/4" IN DEPTH OR GREATER THAN 1 3/4" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS THIS PAGE)
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.		

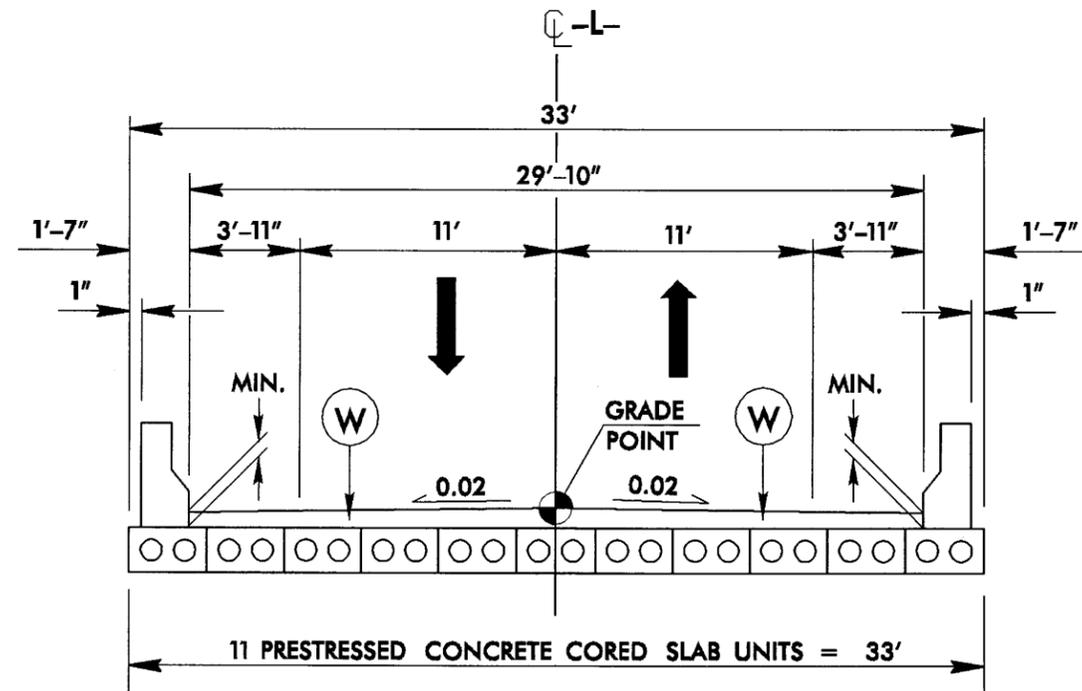
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED



Wedging Detail For Resurfacing



Detail Showing Method of Wedging



TYPICAL SECTION ON STRUCTURE

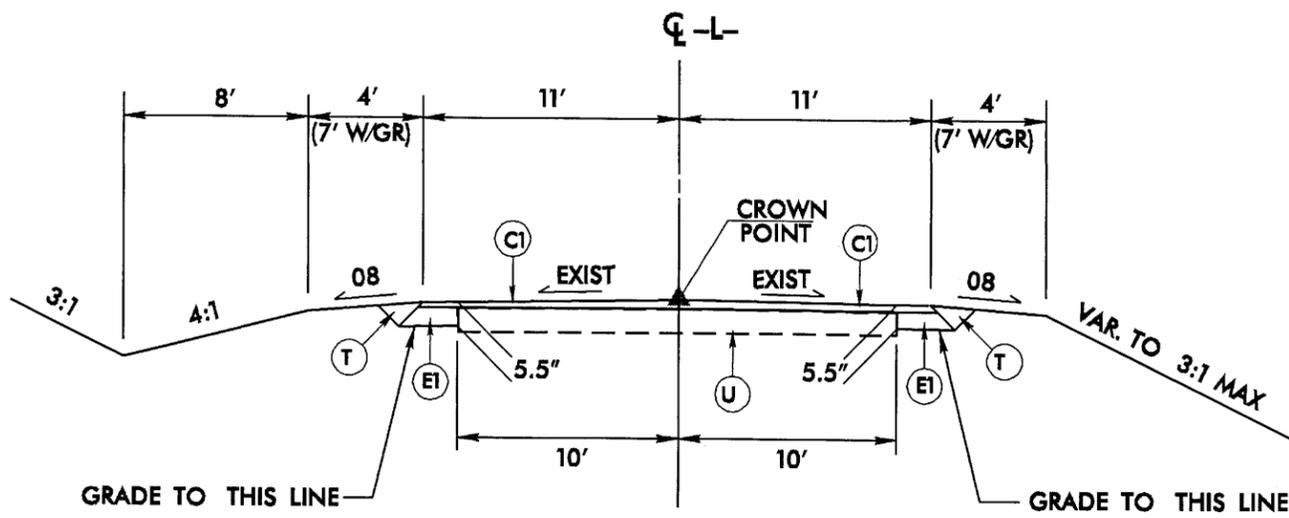
-L- STA 16+65+/- TO STA 17+55+/-

REVISIONS

8/17/99

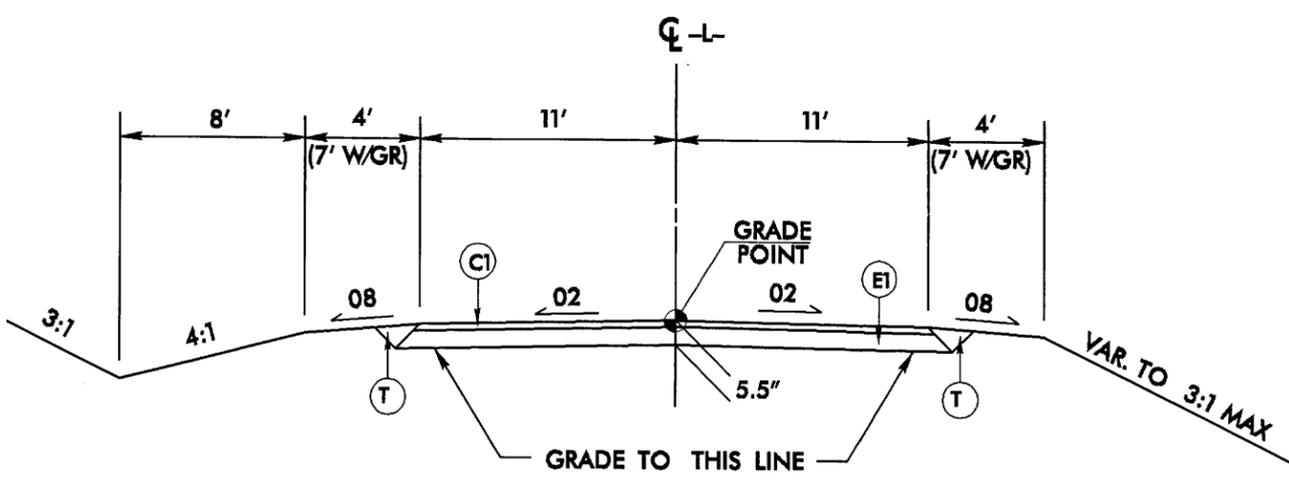
25-JUL-2007 09:24  
 4135\_rdy\_twp.dgn  
 3022338

PROJECT REFERENCE NO. B-4135		SHEET NO. 2-A	
RAW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			
C1	1½" TYPE SF9.5A		
E1	4" TYPE B25.0B		
T	EARTH MATERIAL		
U	EXISTING PAVEMENT		



**TYPICAL SECTION NO. 1**

**USE TYPICAL SECTION NO. 1**  
 -L- STA 13+78.00 TO STA 15+77.00  
 -L- STA 19+20.00 TO STA 20+42.00



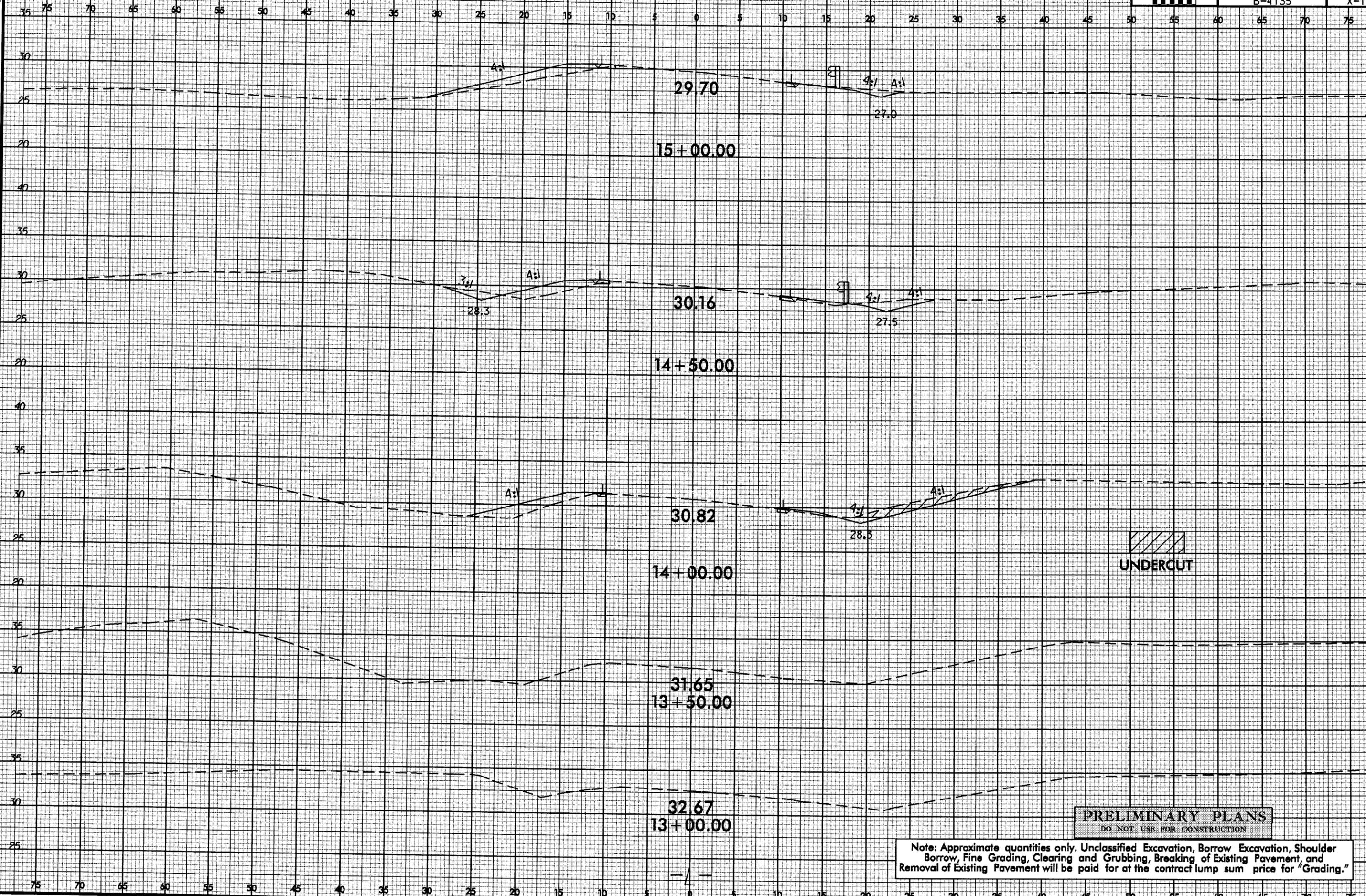
**TYPICAL SECTION NO. 2**

**USE TYPICAL SECTION NO. 2**  
 -L- STA 15+77.00 TO STA 16+65± (BEGIN BRIDGE)  
 -L- STA 17+55± (END BRIDGE) TO STA 19+20.00

REVISIONS



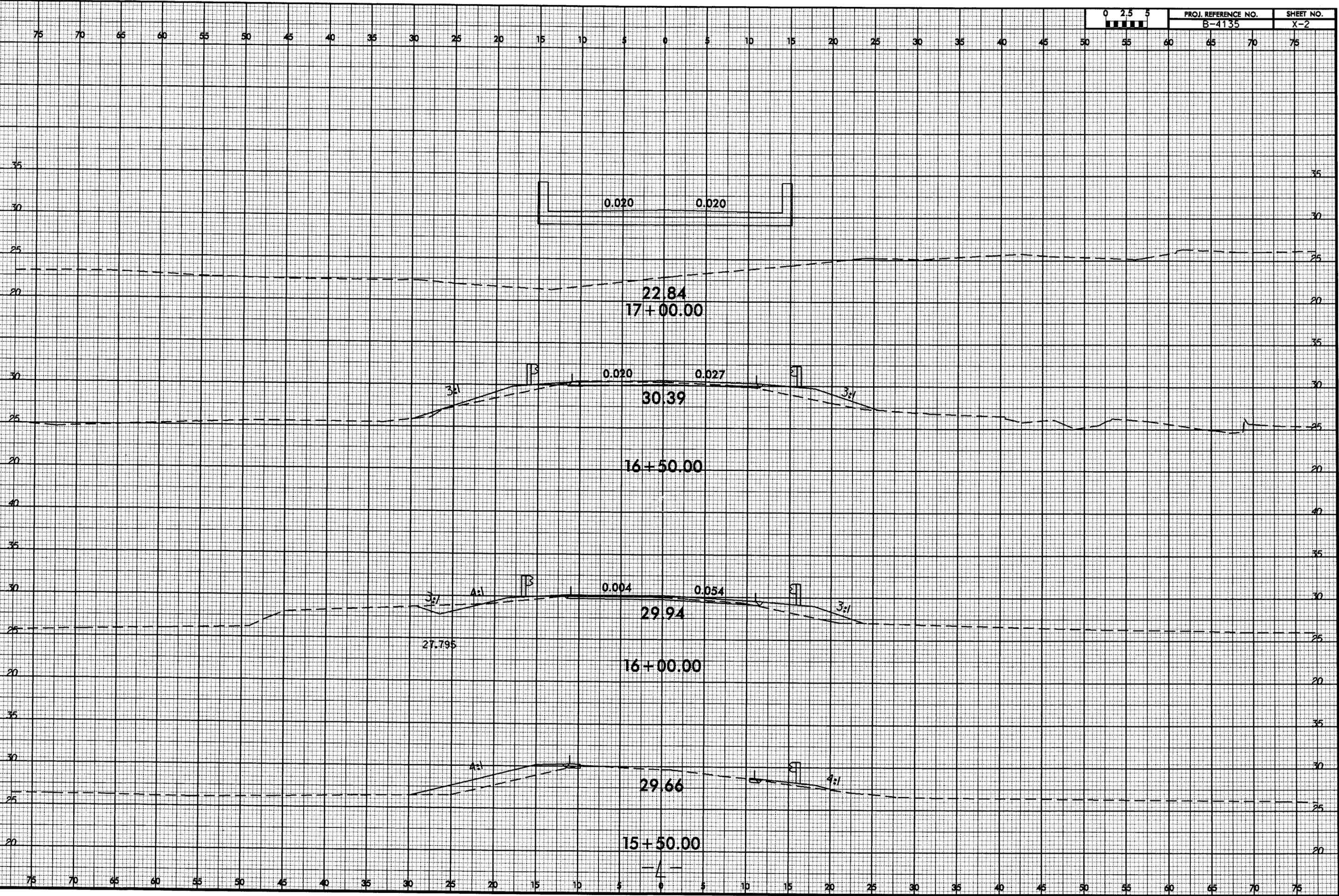
8/23/99



Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

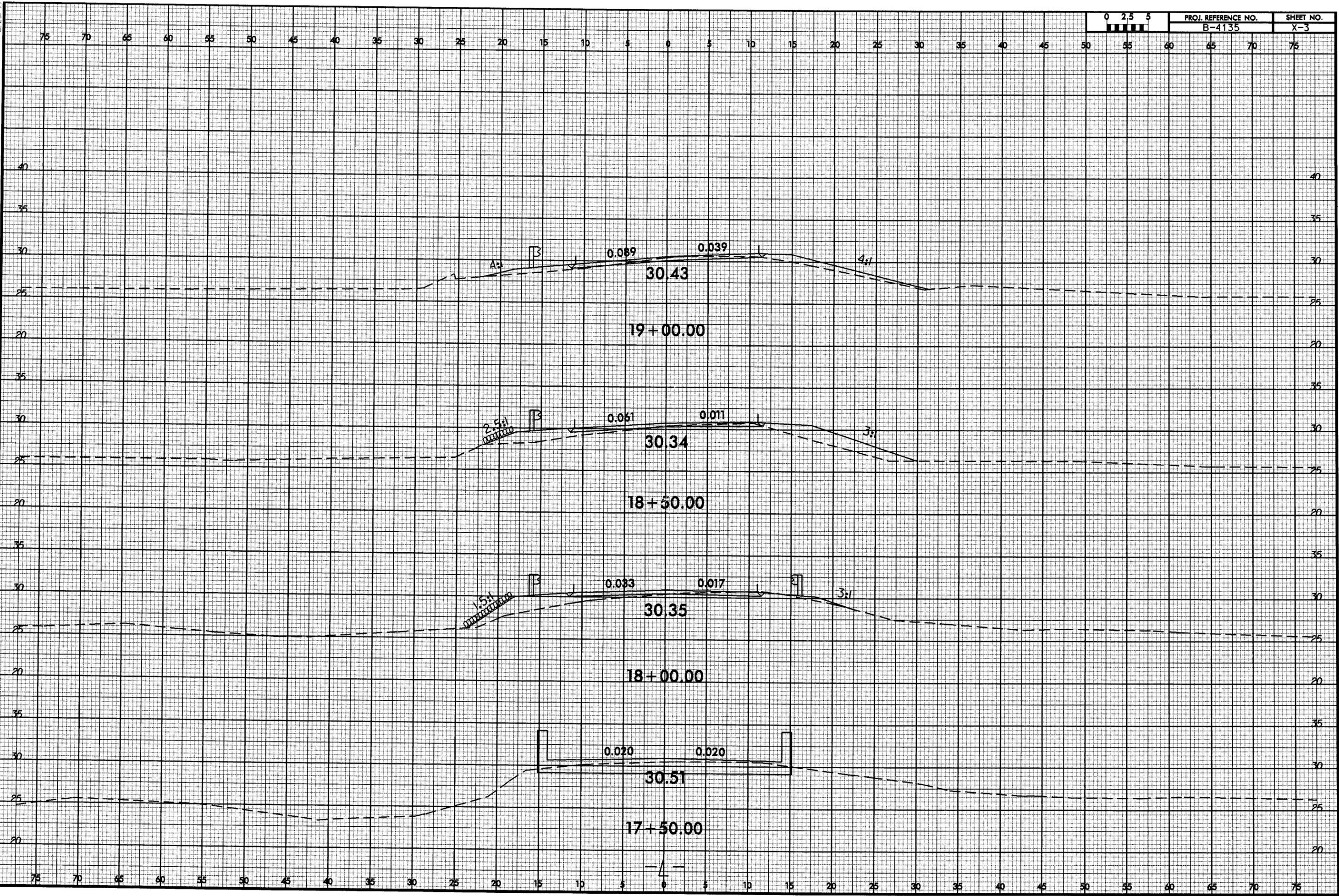
25-JUL-2007 09:24  
RAVPOG0001.XSC\B4135\_rdy\_xpl.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$

8/23/99



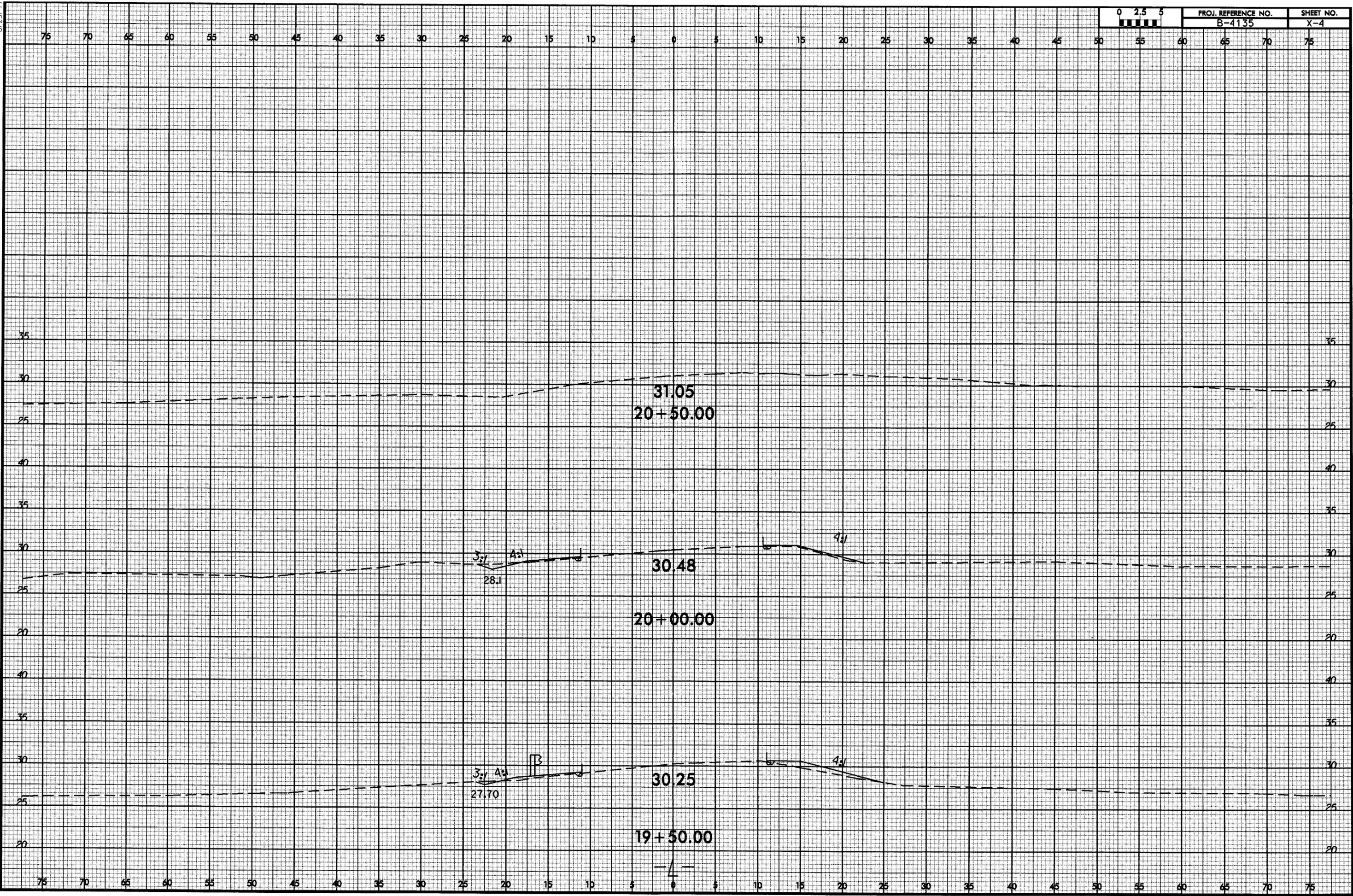
25 JUL 2007 09:24  
C:\P\4135\_rdy\_xpl.dgn  
\$\$\$\$\$SERNAME\$\$\$\$\$

8/23/99



25-JUL-2007 09:25  
R:\Roads\p\XSC\B4135\_r.dwg\_xpl.dgn  
\$\$\$USERNAME\$\$\$

8/23/99



25-JUL-2007 09:25  
R:\p09\p09\XSC\B4135\_rdy\_xpl.dgn  
\$\$\$\$USERNAME\$\$\$\$

**CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM**

TIP Project No.	<u>B-4135</u>
State Project No.	<u>8.2301701</u>
WBS No.	<u>33488.1.1</u>
Federal Project No.	<u>BRZ-1804(2)</u>

**A. Project Description:**

This project proposes to replace Bridge No. 72 on SR 1804 over Cypress Swamp in Halifax County (See Figure 1). The bridge will be replaced with a 70-foot long bridge in the same location and roadway elevation as the existing structure. The cross section of the new bridge will include two 11-foot lanes with 3-foot offsets. The approach work will consist of earthwork, paving, some resurfacing and tying back into the existing roadway for approximately 760 feet to the west and 900 feet to the east. Guardrail will be installed where warranted. Traffic will be detoured offsite during construction (See Figure 1 and Section D, Studied Detour Route).

**B. Purpose and Need:**

Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 31.1 out of a possible 100 for a new structure. The existing bridge was constructed in 1952. Bridge No. 72 is composed entirely of timber and has a structural appraisal of two out of a possible nine. The bridge is considered to be structurally deficient according to FHWA standards and therefore eligible for FHWA's Highway Bridge Replacement Program.

**C. Proposed Improvements:**

The following Type II improvements which apply to the project are circled:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).
  - a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
  - b. Widening roadway and shoulders without adding through lanes
  - c. Modernizing gore treatments
  - d. Constructing lane improvements (merge, auxiliary, and turn lanes)
  - e. Adding shoulder drains
  - f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
  - g. Providing driveway pipes
  - h. Performing minor bridge widening (less than one through lane)
  - i. Slide Stabilization
  - j. Structural BMP's for water quality improvement
  
2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.

- a. Installing ramp metering devices
- b. Installing lights
- c. Adding or upgrading guardrail
- d. Installing safety barriers including Jersey type barriers and pier protection
- e. Installing or replacing impact attenuators
- f. Upgrading medians including adding or upgrading median barriers
- g. Improving intersections including relocation and/or realignment
- h. Making minor roadway realignment
- i. Channelizing traffic
- j. Performing clear zone safety improvements including removing hazards and flattening slopes
- k. Implementing traffic aid systems, signals, and motorist aid
- l. Installing bridge safety hardware including bridge rail retrofit

3. Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.

- a. Rehabilitating, reconstructing, or replacing bridge approach slabs
- b. Rehabilitating or replacing bridge decks
- c. Rehabilitating bridges including painting (no red lead paint), scour repair, fender systems, and minor structural improvements
- d. Replacing a bridge (structure and/or fill)

- 4. Transportation corridor fringe parking facilities.
- 5. Construction of new truck weigh stations or rest areas.
- 6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.
- 7. Approvals for changes in access control.
- 8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.
- 9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.
- 10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.
- 11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.
- 12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types

of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.

- 13. Acquisition and construction of wetland, stream and endangered species mitigation sites.
- 14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

**D. Special Project Information:**

**Estimated Costs:**

Total Construction	\$ 375,000
Paving SR 1802	\$ 850,000
Right of Way	\$ 36,800
Total	\$ 1,261,800

**Estimated Traffic:**

Current	- 220 vpd
Year 2025	- 400 vpd
TTST	- 2%
Dual	- 2%

**Proposed Typical Cross Section:**

The proposed approach typical section will consist of two 11-foot lanes with four-foot offsets that extend to seven feet where guardrail is required.

**Design Speed:**

60 mph There is an anticipated design exception for horizontal curvature.

**Functional Classification:**

Rural Local Route

**Studied Detour Route**

The studied detour route utilized SR 1802, SR 1800, US 258, and SR 1118. SR 1802 will be paved approximately 1.1 miles as part of the project in order to be used as part of the detour. The detour is approximately 12 miles long with an estimated delay of eleven minutes. The delay has been evaluated in accordance with the NCDOT Guidelines for Evaluation of Offsite Detours against the potential environmental impacts of using an onsite detour or locating the bridge on new alignment. An offsite detour will be used and road closure time minimized to the extent possible.

**Division Office Comments:**

The Division Four Construction Offices concurs with replacing Bridge No. 72 at the same location and elevation as the existing structure while detouring traffic offsite during construction.

**Bridge Demolition:**

Bridge No. 72 has a superstructure composed of timber flooring on timber joists with timber rails. The substructure is composed of timber bulkheads at the end bents with timber piles. The interior bents are timber caps on timber piles. Therefore, there is no temporary fill in Cypress Swamp associated with the removal of Bridge No. 72.

**Alternates Eliminated from Further Study**

The no-build alternate for this project is not practical or feasible. The existing bridge will continue to deteriorate necessitating eventual closure of the bridge. This is unacceptable due to the traffic that SR 1804 serves.

Rehabilitation of the existing structure is not feasible due to the timber substructure.

Replacing the bridge on new alignment or maintaining traffic onsite with a temporary detour would be costly and significantly increase the environmental impacts on the wetlands composed of Cypress Gum Swamp that surround the existing structure.

**E. Threshold Criteria**

The following evaluation of threshold criteria must be completed for Type II actions

<u>ECOLOGICAL</u>	<u>YES</u>	<u>NO</u>
(1) Will the project have a substantial impact on any unique or important natural resource?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(2) Does the project involve habitat where federally listed endangered or threatened species may occur?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(3) Will the project affect anadromous fish?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(4) If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-tenth (1/10) of an acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(5) Will the project require the use of U. S. Forest Service lands?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(6) Will the quality of adjacent water resources be adversely impacted by proposed construction activities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(7) Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(8) Will the project require fill in waters of the United States in any of the designated mountain trout counties?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(9) Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>PERMITS AND COORDINATION</u>	<u>YES</u>	<u>NO</u>
(10) If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(11) Does the project involve Coastal Barrier Resources Act resources?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(12) Will a U. S. Coast Guard permit be required?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- (13) Will the project result in the modification of any existing regulatory floodway?   X
- (14) Will the project require any stream relocations or channel changes?   X

**SOCIAL, ECONOMIC, AND CULTURAL RESOURCES**

**YES**      **NO**

- (15) Will the project induce substantial impacts to planned growth or land use for the area?   X
- (16) Will the project require the relocation of any family or business?   X
- (17) Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?   X
- (18) If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?  X
- (19) Will the project involve any changes in access control?   X
- (20) Will the project substantially alter the usefulness and/or land use of adjacent property?   X
- (21) Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?   X
- (22) Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?  X
- (23) Is the project anticipated to cause an increase in traffic volumes?   X
- (24) Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?  X
- (25) If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?  X

- |      |   |                          |                          |
|------|---|--------------------------|--------------------------|
| (26) | Is there substantial controversy on social, economic, or environmental grounds concerning the project?  | <input type="checkbox"/> | <u>  X  </u>             |
| (27) | Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?   | <u>  X  </u>             | <input type="checkbox"/> |
| (28) | Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?  | <input type="checkbox"/> | <u>  X  </u>             |
| (29) | Will the project affect any archaeological remains, which are important to history or pre-history?  | <input type="checkbox"/> | <u>  X  </u>             |
| (30) | Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites, or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)? | <input type="checkbox"/> | <u>  X  </u>             |
| (31) | Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?  | <input type="checkbox"/> | <u>  X  </u>             |
| (32) | Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the Natural System of Wild and Scenic Rivers?  | <input type="checkbox"/> | <u>  X  </u>             |

**F. Additional Documentation Required for Unfavorable Responses in Part E**

**ITEM NO.**

3. North Carolina Division of Marine Fisheries stated that anadromous fish are found in this section of Cypress Swamp. Therefore, an in-stream work moratorium from February 15 to September 30 will be in effect. NCDOT will adhere to the "Stream Guidelines for Anadromous Fish Crossings."
4. The amount of wetland impact is estimated to be approximately 0.30 acre. This estimate is based on preliminary plans and will be refined for the permit application. All practical measures have been taken to avoid and minimize impacts to the wetlands by replacing the existing bridge with a new bridge in the same location and roadway elevation. The approach roadway typical section is the minimum required for safety measures such as guardrail.

In accordance with provisions of Section 404 of the Clean Water Act, a permit will be required from the US Army Corps of Engineers (USACOE) for discharge of fill material into Waters of the United States. Due to the small amount of estimated wetland impacts, a Section 404 Nationwide Permit is anticipated. However, the type of permit will be determined during the final

G. plan design stage.  
**CE Approval**

TIP Project No.	<u>B-4135</u>
State Project No.	<u>8.2301701</u>
WBS No.	<u>33488.1.1</u>
Federal Project No.	<u>BRZ-1804(2)</u>

Project Description:

This project proposes to replace Bridge No. 72 on SR 1804 over Cypress Swamp in Halifax County (See Figure 1). The bridge will be replaced with a 70-foot long bridge in the same location and roadway elevation as the existing structure. The cross section of the new bridge will include two 11-foot lanes with 3-foot offsets. The approach work will consist of earthwork, paving, some resurfacing and tying back into the existing roadway for approximately 760 feet to the west and 900 feet to the east. Guardrail will be installed where warranted. Traffic will be detoured offsite during construction ( See Figure 1 and Section D, Studied Detour Route).

Categorical Exclusion Action Classification:

       TYPE II(A)  
  X   TYPE II(B)

Approved:

<u>5/25/04</u> Date	<u>Deesa Hart</u> Assistant Branch Manager Project Development and Environmental Analysis Branch
<u>6/10/04</u> Date	<u>William T. Gordon</u> Project Planning Unit Head Project Development & Environmental Analysis Branch
<u>6/10/04</u> Date	<u>Karen B. Capps, PE.</u> Project Development Engineer Project Development & Environmental Analysis Branch

For Type II(B) projects only:

<u>6/14/04</u> Date	<u>John F. Sullivan, III, PE</u> John F. Sullivan, III, PE, Division Administrator Federal Highway Administration
------------------------	---

# PROJECT COMMITMENTS

Halifax County  
Bridge No. 72 on SR 1804 Over Cypress Swamp  
Federal Aid Project No. BRZ-1804(2)  
State Project No. 8.2301701  
WBS No. 33532.1.1  
T.I.P. No. B-4135

## *Division 1 Construction Engineer, Structure Design Unit*

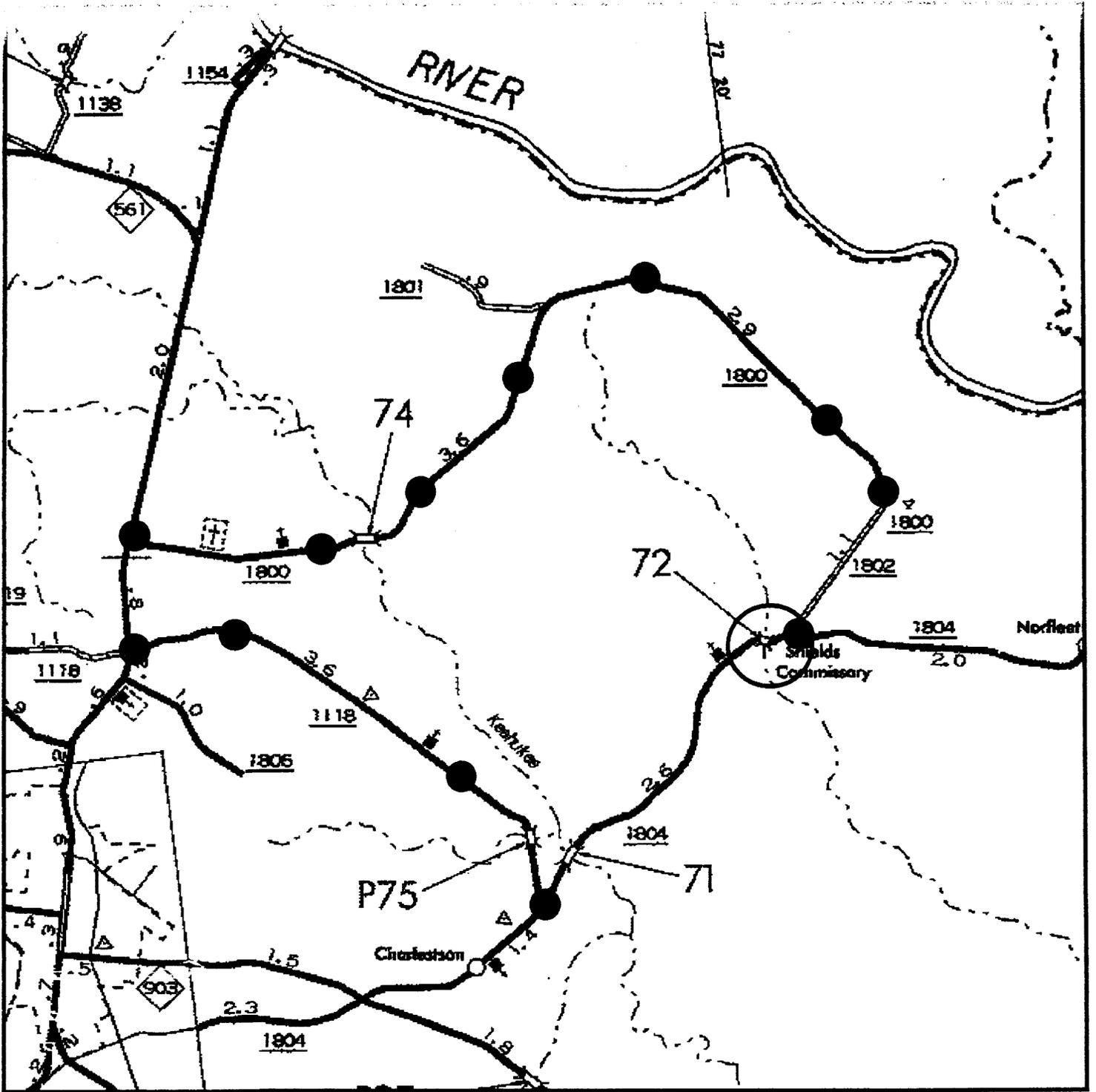
The proposed structure should be designed to facilitate top-down construction. If it is determined that top-down construction cannot be used, then additional coordination with the United States Army Corps of Engineers will be required.

No deck drains will be allowed to discharge directly into Cypress Swamp.

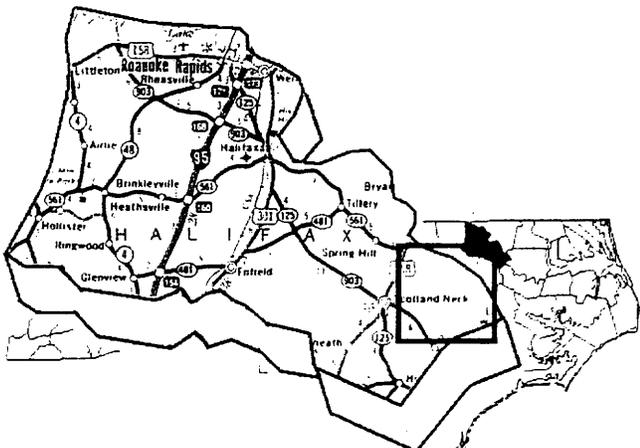
## *Division 1 Construction Engineer, Structure Design Unit, Roadway Design Unit*

The total time of **road closure** for this project should be held to to a minimum due to the length of delay in using the detour route. The contractor should be given incentives to minimize the road closure for the project. The **total project construction time** can be longer, as long as work can be done under traffic. Halifax County Emergency Management Services will be notified a minimum of thirty (30) days in advance of the beginning of the road closure.

Cypress Swamp has potential as a travel corridor for anadromous fish. Therefore, an in-stream moratorium will be in effect from February 15 to September 30. The Stream Crossing Guidelines for Anadromous Fish Passage will be implemented, as applicable.

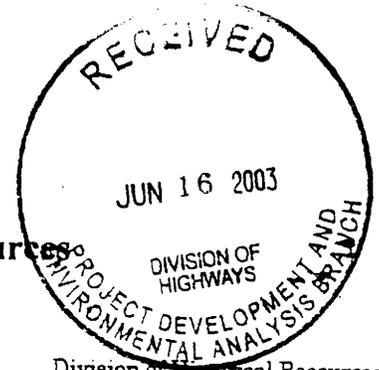


●—●—●— Studied Detour Route



	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH
	<p align="center"> <b>HALIFAX COUNTY</b>  <b>REPLACE BRIDGE NO. 72 ON SR 1804</b>  <b>OVER CYPRESS SWAMP</b>  <b>B-4135</b> </p>

Figure 1



**North Carolina Department of Cultural Resources  
State Historic Preservation Office**

David L. S. Brook, Administrator

Michael F. Easley, Governor  
Lisbeth C. Evans, Secretary  
Jeffrey J. Crow, Deputy Secretary

Division of Historical Resources  
David J. Olson, Director

June 11, 2003

**MEMORANDUM**

TO: Greg Thorpe, Manager  
Project Development and Environmental Analysis Branch  
NCDOT Division of Highways

FROM: David Brook *DLS for David Brook*

SUBJECT: Replacement of Bridge No. 72 on SR 1804 over Cypress Swamp, B-4135,  
Halifax County, ER03-0939

Thank you for your memorandum of April 7, 2003, concerning the above project.

There are no known archaeological sites within the proposed project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for conclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

We recommend that a Department of Transportation architectural historian identify and evaluate any structures over fifty years of age within the project area and report the findings to us.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Mary Pope Furr, NCDOT  
Matt Wilkerson, NCDOT

[www.hpo.dcr.state.nc.us](http://www.hpo.dcr.state.nc.us)

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St., Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-4763 • 733-8653
RESTORATION	515 N. Blount St., Raleigh NC	4613 Mail Service Center, Raleigh NC 27699-4613	(919) 733-6547 • 715-4801
SURVEY & PLANNING	515 N. Blount St., Raleigh NC	4618 Mail Service Center, Raleigh NC 27699-4618	(919) 733-6545 • 715-4801

# **NATURAL SYSTEMS REPORT**

B-4135

HALIFAX COUNTY, NORTH CAROLINA

## **Natural Systems Report**

**B-4135**  
Halifax County, North Carolina

Prepared for:  
North Carolina Department of Transportation

Prepared by:  
ARCADIS G&M of North Carolina, Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh  
North Carolina 27607  
Tel 919 854 1282  
Fax 919 854 5448

Our Ref.:  
NC602031.0003

Date:  
March 2003

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential, and exempt from disclosure under applicable law. Any dissemination, distribution, or copying of this document is strictly prohibited.

## Table of Contents

<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>1. Introduction</b>	<b>1-1</b>
1.1 Project Description	1-1
1.2 Purpose	1-1
1.3 Methodology	1-2
1.4 Qualifications of Principal Investigator	1-3
<b>2. Physical Resources</b>	<b>2-1</b>
2.1 Geology	2-1
2.2 Soils	2-1
2.3 Water Resources	2-3
2.4 Physical Resources Impacts	2-5
<b>3. Biotic Resources</b>	<b>3-1</b>
3.1 Plant Communities	3-1
3.1.1 Cypress-Gum Swamp (Brownwater Subtype)	3-1
3.1.2 Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	3-2
3.1.3 Maintained/Disturbed Lands	3-2
3.2 Terrestrial Wildlife	3-3
3.3 Aquatic Habitats and Wildlife	3-4
3.4 Biotic Resource Impacts	3-5
<b>4. Waters of the United States</b>	<b>4-1</b>
4.1 Surface Waters	4-1
4.2 Jurisdictional Wetlands	4-2
4.3 Impacts to Waters of the United States	4-3
4.4 Permit Requirements	4-4
4.5 Mitigation	4-4

## Table of Contents

<b>5. Rare and Protected Species</b>	<b>5-1</b>
5.1 Vertebrates	5-1
5.2 Invertebrates	5-3
<b>6. References</b>	<b>6-1</b>

### Tables

1	Descriptions of Soils Mapping Mnits Within the Project Study Area
2	NPDES Dischargers Within the Cypress Swamp Watershed, Halifax County, North Carolina
3	Federally Protected Species Known from Halifax County, North Carolina
4	Federal Species of Concern Known from Halifax County, North Carolina

### Figures

1	Vicinity Map
2	Natural Communities and Surface Waters

### Appendices

A	Wetland Data Forms
B	Wetland Rating Forms

## **EXECUTIVE SUMMARY**

The following is a Natural Systems Technical Report for the proposed replacement of Bridge No. 72 over Cypress Swamp on SR 1804 in Halifax County, North Carolina (TIP No. B-4135).

## **INTRODUCTION**

The proposed project will replace Bridge No. 72 on SR 1804 over Cypress Swamp in Halifax County, North Carolina. The project study area is primarily disturbed urban and agricultural land and forested acres. The project study area is located in the Coastal Plain physiographic region, approximately 20 to 50 feet (6 to 15 meters) above mean sea level. The one hydric soil mapping unit within the project study area is Chewacla and Wehadkee soils.

## **PHYSICAL CHARACTERISTICS**

### **Water Resources**

Water resources located within the project study area lie in North Carolina Division of Water Quality (NCDWQ) Subbasin 03-02-08 and the United States Geological Survey Subbasin 03010107 of the Roanoke River Drainage Basin. The best usage classification of Cypress Swamp (NCDWQ Stream Index #23-41) is Class C (NCDEM, 2001). No water resources classified as Nutrient Sensitive Waters (NSW), High Quality Waters, Water Supplies Waters, or Outstanding Resource Waters or waters on the 303(d) list are located within the project study area.

### **Biotic Resources**

The following three plant communities were found within the project study area: cypress-gum swamp (brownwater subtype), mesic mixed hardwood forest (Coastal Plain subtype), and maintained/disturbed lands. The following table shows the plant community acreages within the project study area.

### **Plant Communities**

Community	Area
Cypress-gum swamp (brownwater subtype)	9.87 ac (4.00 ha)
Mesic mixed hardwood forest (Coastal Plain subtype)	2.42 ac (0.98 ha)
Maintained/disturbed lands	22.42 ac (9.08 ha)

### **JURISDICTIONAL TOPICS**

#### **Surface Waters and Wetlands**

Cypress Swamp, a manmade pond, and an unnamed tributary are considered jurisdictional surface waters under Section 404 of the Clean Water Act. Based upon the results of the field investigation, the project study area also contains 9.27 acres (3.75 hectares) of PFO1/2F and PFO1C jurisdictional wetlands. Since no alternatives have been selected, impacts to these “Waters of the United States” cannot be determined.

Due to the potential for water quality impacts during construction, in-stream construction moratoriums to limit the effects on fishery resources have been suggested. The moratorium applies if the following species are supported by the stream: sturgeon (February 1 to June 30), brown and brook trout (October 15 to April 15), rainbow trout (January 1 to April 15), spotfin chub (May 15 to August 15), smallmouth bass (May 1 to July 15), eastern sunfish (April 1 to June 30), western sunfish (May 1 to June 30), and other anadromous fish (February 15 to June 30). A 25 foot (7.6 m) buffer moratorium exists relative to the smallmouth bass. Qualified biologists from the NCDOT will assess the stream for the abovementioned species. Once the fish have been identified as being supported by the stream, the appropriate moratorium will be applied.

Essential fish habitat (EFH) is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The aforementioned waters include aquatic areas and their associated physical, chemical, and biological properties used by fish and include aquatic areas historically used by fish where appropriate. The aforementioned substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities. The proposed project is not anticipated to involve EFH.

**Permits**

The Nationwide Permit #23 (Approved Categorical Exclusions) should cover the impacts to jurisdictional stream in the project study area. Nationwide Permit #33 (Temporary Construction, Access, and Dewatering) may be needed for temporary construction access if that is not addressed in National Environmental Policy Act (NEPA) document. A final permitting strategy cannot be developed until a design alternative is selected.

A Section 401 General Water Quality Certification is also required for any activity that may result in a discharge into “Waters of the United States” or for which an issuance of a federal permit or license is issued. Certifications are administered through the NCDWQ. Final determination of permit applicability lies with the United States Army Corps of Engineers (USACE).

**Federally Protected Species**

Plants and animals with federal classification of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act. As of February 18, 2003, the United States Fish and Wildlife Service (USFWS) identified three endangered species and one threatened species as potentially occurring in Halifax County. The following table lists each species, its federal status, and biological conclusion.

<b>Scientific Name</b>	<b>Common Name</b>	<b>Federal Status</b>	<b>Biological Conclusion</b>
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Threatened	No Effect
<i>Picoides borealis</i>	Red-cockaded woodpecker	Endangered	No Effect
<i>Elliptio steinstansana</i>	Tar spiny mussel	Endangered	No Effect
<i>Alasmidonta heterodon</i>	Dwarf wedge mussel	Endangered	No Effect

**Bald Eagle**

**Biological Conclusion: No Effect**

Suitable habitat for the bald eagle consisting of large bodies of water does not exist within the project area. In addition, there is a large amount of human disturbance around the project area. Review of North Carolina Natural Heritage Program (NCNHP) maps indicated no known populations of this species within one mile (1.6 km) of the project study area. No impacts to this species from project construction are anticipated.

**Red-Cockaded Woodpecker                      Biological Conclusion: No Effect**

Suitable habitat for the red-cockaded woodpecker is not present in the project study area. There are no areas of open or mature pine stands and NCNHP has no records of any known populations of the red-cockaded woodpecker within the project study area. No impacts are anticipated to the red-cockaded woodpecker because of project construction.

**Tar River Spiny mussel                      Biological Conclusion: No Effect**

Suitable habitat for the Tar River spiny mussel is not present in the project study area. NCNHP has no records of any known populations of the Tar River spiny mussel within a one-mile (1.6 km) radius of the project area. This mussel has never been found in the Roanoke River watershed. Therefore, this species will not be impacted because of project construction.

**Dwarf wedge mussel                      Biological Conclusion: No Effect**

Suitable habitat is not available in Cypress Swamp. NCNHP has no records of any known populations of dwarf wedge mussel within a one-mile (1.6 km) radius of the project area. This mussel has never been found in the Roanoke River watershed. Therefore, this species will not be impacted because of project construction.

Surveys for all of these species are valid for two years from the survey data. If the project is not constructed within those two years, then all of these species may need to be resurveyed before the let date.

**CONCLUSIONS**

Jurisdictional surface waters within the project area consist of approximately 50 linear feet (15 meters), and 440 linear feet (134 meters) associated with an unnamed tributary, and a manmade pond, respectively. In addition, approximately 9.27 acres (3.75 hectares) of jurisdictional wetlands associated with Cypress Swamp occur within the project study area. Since no alternatives have been selected, impacts to these “Waters of the United States” cannot be determined. A Nationwide Permit #23, a Nationwide Permit #33, and a Section 401 General Water Quality Certification may also be required for the project. No federally protected species are likely to be impacted by this project. No High Quality Resources exist on the project study area.

During replacement of the bridge, construction of an onsite temporary detour bridge, use of existing roadways for an off-site detour, or construction of an offsite temporary detour bridge will be required. Approximately 9.72 acres (3.75 hectares) of riverine wetlands are located within the floodplain of Cypress Swamp. Additionally, a manmade pond and an unnamed tributary to Cypress Swamp are located in the northwestern portion of the site. If an off-site detour is not feasible and an onsite temporary bridge is necessary, the detour will be designed such that impact to the manmade pond and unnamed tributary to Cypress Swamp will not occur. If an onsite temporary detour crosses the riverine wetlands, a geotechnical investigation of the wetland substrate's consolidation potential will have to be performed. Construction of a temporary detour bridge within the wetland area will potentially degrade the ability of the wetland to function as well as it did before extreme compaction or distortion of the substrate occurred from the weight of the bridge.

The existing causeway is comprised of compacted soils and is abutted by wetlands to the north and south. The causeway extends beyond the wetlands associated with the floodplain of Cypress Swamp. Removal of sections of the existing causeway, thereby lengthening the bridge, has the potential to impact abutting wetlands. Based on the width of the stream channel relative to the existing causeway, lengthening the bridge will not improve surface flows.

## **1. Introduction**

ARCADIS G&M of North Carolina, Inc. (ARCADIS) has been retained by the North Carolina Department of Transportation (NCDOT) to prepare a Natural Systems Technical Report for the replacement of Bridge No. 72 over Cypress Swamp on SR 1804 in Halifax County, North Carolina. The following Natural Systems Technical Report is submitted to assist in the preparation of the Categorical Exclusion (CE) for the proposed project.

### **1.1 Project Description**

The proposed project, TIP No. B-4135, will replace Bridge No. 72 over Cypress Swamp in Halifax County, North Carolina (Figure 1). The bridge is currently in poor condition with numerous cracks and heavy deterioration. Rehabilitation of the existing structure does not appear to be a feasible option due to its age and condition. The replacement will result in a safer structure, consistent with federal and state bridge standards.

No alternatives for the proposed project have been defined; therefore, a corridor along SR 1804, extending approximately 2,850 feet (868.7 meters) in length and 675 feet (205.7 meters) in width and encompassing approximately 34.7 acres (14.05 hectares), was studied. Due to the lack of a distinct channel and the naturally broad swamp system, no stream channel lengths were determined for Cypress Swamp. However, approximately 9.27 acres (3.75 hectares) of jurisdictional wetlands occur within the project study area near the bridge crossing. The project vicinity is defined as a larger area, approximately one-half mile on all sides of the study area. The project region is the area more or less represented on a standard 7.5-minute United States Geological Survey (USGS) topographic quadrangle map.

Since no alternatives have been identified, impacts to Waters of the United States cannot be determined. However, bridge demolition activities will strictly follow NCDOT's *Best Management Practices for Bridge Demolition and Removal* (BMPs-BDR). As per the BMPs-BDR, all methods of demolition shall be considered and implemented where practical, other than dropping the bridge in the water.

### **1.2 Purpose**

The purpose of this technical report is to inventory, catalog, and describe the natural systems within the study area. Recommendations are made for measures that will minimize resource impacts, as well as preliminary determinations of permit needs and

mitigation options. These descriptions and estimates are based only on the defined study area since no preliminary concepts have been formulated. If the project study area or criteria change, additional field investigations will be necessary.

### **1.3 Methodology**

Qualified biologists from ARCADIS conducted field investigations within the project study area during January 2003. Pedestrian surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, and the presence of protected species or their habitats.

Published information regarding the project area and region was derived from a number of resources including: USGS 7.5-Minute Topographical Quadrangle Map (Norfleet, North Carolina), United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map, and NCDOT aerial photomosaics of the project area (1"=100'). Water resources information was obtained from publications of the North Carolina Division of Water Quality (NCDWQ). Information concerning the occurrence of federal and state protected species within the project area and vicinity was gathered from the USFWS list of protected species (May 2002) and the North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats (January 2003).

Dominant plant species were identified in each strata for all natural communities encountered. Plant community descriptions are based on those classified in Schafale and Weakley (1990), where applicable. For the context of this report, community classifications have been modified in some instances to better reflect field observations. Names and descriptions of plant species generally follow Radford, et al. (1968), unless more current information is available. Animal names and descriptions follow Martof, et al. (1980), Rohde, et al. (1994), and Webster, et al. (1985). Scientific nomenclature and common names (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism include the common name only.

During surveys, wildlife identification involved a variety of observation techniques: active searching and capture, visual observations (both with and without the use of binoculars), and observing the characteristic signs of wildlife (sounds, scats, tracks, and burrows). Organisms captured during these searches were identified and released without injury. Quantitative water sampling was not undertaken to support existing data.

Jurisdictional wetland determinations were performed using the three-parameter approach as prescribed in the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). Supplementary technical literature describing the parameters of hydrophytic vegetation, hydric soils, and hydrological indicators was also utilized. Wetland functions were evaluated according to the NCDWQ's Rating System, 4<sup>th</sup> version (1995).

#### **1.4 Qualifications of Principal Investigator**

Investigator: Layna E. Thrush, Biologist

Education: BS, Political Science, Florida State University  
MS, Forestry, North Carolina State University

Experience: ARCADIS, May 2001 to present

Expertise: National Environmental Policy Act (NEPA) investigations, Section 7 investigations, wetland determinations and delineations, and stream determinations and delineations.

Investigator: Kimberly Y. Matthews, Staff Scientist

Education: BA, Biology, Wittenberg University  
MS, Natural Resource Management, North Carolina State University

Experience: ARCADIS, December 2002 to present

Expertise: Wetland determinations and delineations, and stream determinations and delineations.

## **2. Physical Resources**

Halifax County is situated along the Fall Line. The eastern portion of the county lies in the Coastal Plain physiographic province and the western portion of the county lies in the Piedmont physiographic province of North Carolina. The geography of the county consists predominantly of nearly level floodplains and interstream divides below the Fall Line with gentle slopes in the interstream divides above the Fall Line. Nearly level floodplains abut most of the streams in the region. Elevations in the project study area range from approximately 20 feet (6 meters) above mean sea level (MSL) to 50 feet (15 meters) above MSL, as depicted on the Norfleet, North Carolina USGS topographic quadrangle map.

### **2.1 Geology**

The Coastal Plain physiographic province of North Carolina is composed of parent material dating back 65 to 135 million years. This parent material is associated with the pre-mesozoic basement rock. The region of pre-mesozoic basement rock associated with the project study area is well known for its deposits of mica and clay materials in the sandy matrix.

### **2.2 Soils**

The process of soil development depends on both biotic and abiotic influences. These influences include past geologic activities, nature of parent materials, environmental and human influences, plant and animal activity, time, climate, and topographic position. Coarsely mapped soil areas are referred to as soil associations. These soil associations are defined as landscapes that exhibit distinctive proportional patterns of soils consisting of one or more major soils and at least one minor soil. The soils within an association generally vary in slope, depth, stoniness, drainage, and other characteristics.

There are two soil associations present in the project study area: State-Altavista and Chewacla-Riverview. The State-Altavista soil association is comprised of nearly level and gently sloping, well drained and moderately well drained soils that have a loamy surface layer and a loamy subsoil. This soil is found on fluvial terraces adjacent to the Chewacla-Riverine soil association. The landscape is characterized by broad, smooth ridges, flats, and depressions, all rarely floods. The minor soils include Chastain, Bibb, Chewacla, and Wehadkee soils.

The Chewacla-Riverine soil association is comprised of nearly level, somewhat poorly drained and well drained soils that have a loamy surface and a loamy subsoil. The landscape is characterized by nearly level, broad, smooth flats that are dissected by slightly higher, nearly level ridges. This soil is subject to frequent and occasional flooding. The minor soils include Wehadkee soils, generally found in depressions and back swamps.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (Cowardin et al., 1979). There are four soil units mapped by the Halifax County NRCS (Anderson and Cole, 2001) within the project study area. One of the four soils is listed as hydric: Chewacla and Wehadkee soils have a 0-1% slope and are occasionally flooded. Within the project study area, Chewacla and Wehadkee soils are located along the floodplain of Cypress Swamp. The soil is designated as a Hydric A soil, which indicates that the entire map unit is hydric or hydric soils are a major component of the map unit. State soils have inclusions of Altavista soils on flats, in depressions, and along drainage ways that is designated a Hydric B soil (Gregory, 2001). Descriptions of the four individual mapping units are presented in Table 1.

**Table 1**

**Descriptions of Soil Mapping Units Within the Project Study Area**

<b>Map Unit</b>	<b>Soil Series</b>	<b>Slope</b>	<b>Drainage</b>	<b>General Characteristics</b>
CwA*	Chewacla and Wehadkee soils	0-1%	Somewhat poorly to poorly drained	Nearly level, very deep soils on floodplains along major rivers in the Coastal Plain, with moderate permeability and slow surface runoff
BcA	Bojac loamy fine sand	0-3%	Well drained	Nearly level, very deep soils on broad, smooth ridges on fluvial terraces, with moderately rapid permeability and slow surface runoff
StA	State fine sandy loam	0-2%	Well drained	Nearly level, very deep, soils on broad, smooth ridges on fluvial terraces, with moderate permeability and slow surface runoff
StB	State fine sandy loam	2-6%	Well drained	Gently sloping, very deep soils on ridges on fluvial terraces, with moderate permeability and medium surface runoff

\* Occurs on Hydric Soils list, USDA-NRCS, 1995  
Source: Anderson and Cole, 2001.

### **2.3 Water Resources**

Streams, creeks, and tributaries within the project region are part of the Roanoke River Basin. The Roanoke River begins in Virginia in the Blue Ridge Mountains, flows southeast into North Carolina, and drains into the Albemarle Sound. The basin encompasses approximately 3,503 square miles (9,073 square kilometers) and contains 2,213 miles (3,561 kilometers) of stream. The Roanoke River Basin flows from north central North Carolina southeastward across the Piedmont and Coastal Plain, where it empties into the Pamlico Sound near New Bern. Approximately two-thirds of the land within the basin consists of agricultural and undeveloped forested lands. Wetlands and open water comprise approximately one-fifth of the basin area.

Cypress Swamp is a tributary to the Roanoke River and is located in the southeast corner of Halifax County approximately 7.2 miles (11.6 kilometers) northeast of Scotland Neck. Cypress Swamp appears to originate in wetland areas adjacent to the Roanoke River approximately 4.8 miles (7.7 kilometers) upstream from SR 1804. Cypress Swamp flows in a southeasterly direction and re-converges with the Roanoke River, approximately 4.2 miles (6.8 kilometers) downstream from SR 1804. The project study area is located within NCDWQ Subbasin 03-02-08 and the USGS Subbasin 03010107. The waters of Cypress Swamp are identified by the NCDWQ Stream Index #23-41.

The NCDWQ classifies surface waters of the state based on their intended best uses. All of Cypress Swamp, including the project study area, is classified as C waters. Class C denotes waters suitable for all general uses including aquatic life propagation and survival, fishing, wildlife, primary recreation, and agriculture. No Outstanding Resource Waters (ORW), Nutrient Sensitive Waters (NSW), High Water Quality (HQW), or Water Supplies waters occur within the Cypress Swamp watershed.

The Ambient Monitoring System (AMS) is a network of stream, lake, and estuarine water quality monitoring stations strategically located for the collection of physical and chemical water quality data. The type of water quality data or parameters collected is determined by the waterbodies' classification and corresponding water quality standards. The AMS determines the "use support" status of waterbodies, meaning how well a waterbody supports its designated uses. The waters in the project study area are currently not rated.

A benthic macroinvertebrate sampling study consisting of seven sites within the basin was conducted in 1999; however, Cypress Swamp was not sampled. Two sites on the Roanoke River were sampled. The first site, located approximately 14 miles (22.5

kilometers) upstream from Hills Ferry was rated “Good” and another site approximately 15 miles (24 kilometers) downstream Hills Ferry was rated “Good-Fair” (NCDEM, 2001). This indicates there is a decline in the water quality of the Roanoke River where Cypress Swamp flows into the Roanoke River. Additional sampling is needed to determine the cause of impairment.

Point source dischargers located throughout North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Dischargers are required by law to register for a permit. According to North Carolina Division of Environmental Management (NCDEM) (2001), there are eleven permitted NPDES dischargers in the subbasin, seven of which are minor dischargers (<1.0 MGD). There are no NPDES regulated dischargers within the Cypress Swamp watershed. The major dischargers in the subbasin are located upstream near Roanoke Rapids, NC and downstream near Lewiston, NC. Information concerning these dischargers is included in Table 2.

**Table 2**  
**NPDES Dischargers Within the Cypress Swamp Watershed**  
**Halifax County, North Carolina**

<b>NPDES Permit #</b>	<b>Facility</b>	<b>Permit Type</b>	<b>Water Body</b>
NC0025721	Town of Weldon	Major - Municipal	Roanoke River
NC0024201	Roanoke Rapids Sanitary District	Major - Municipal	Roanoke River
NC0025437	Town of Rich Square	Minor – Municipal	Bridgers Creek
NC0028835	Perdue Farms, Inc./Lewiston	Major – Non-Municipal	Roanoke River
NC0079014	Panda-Rosemary, L.P.	Minor- Non-Municipal	UT Chockoyotte Creek
NC0066192	Town of Halifax	Minor – Municipal	Quankey Creek
NC0035636	Baker Elementary School	Minor – Non-Municipal	UT Kehukee Swamp
NC0027642	Odom Correctional Institute #3310	Minor – Non-Municipal	Roanoke River
NC0029734	Halifax Correction Center #3315	Minor – Non-Municipal	Little Quankey Creek
NC0027626	Caledonia Correctional	Minor – Non-Municipal	Roanoke River
NC0000752	Champion International	Major – Non-Municipal	Roanoke River

Section 303(d) of the Clean Water Act (CWA) requires states to develop a comprehensive public accounting of all impaired waters. The list includes waters impaired by pollutants, such as nitrogen, phosphorus and fecal coliform bacteria, and by pollution, such as hydromodification and habitat degradation. The source of

impairment might be from point sources, nonpoint sources, or atmospheric deposition. There are no listed Section 303(d) impaired waters in the project study area.

#### **2.4 Physical Resources Impacts**

Cut and fill activities associated with bridge approaches and/or relocated road will impact soils due to removal, relocation, and compaction. The primary sources of water-quality degradation in rural areas are agricultural operations and construction. Precautions should be taken to minimize impacts to water resources in the project study area during construction. Aquatic organisms are very sensitive to discharges and inputs resulting from construction. Appropriate measures must be taken to avoid spillage and control runoff.

Potential impacts associated with construction of the proposed project include: increased sedimentation, scouring of the streambed, soil compaction, and loss of shading due to vegetation removal. Increased sedimentation from lateral flows is also expected. Measures to minimize these potential impacts include the formulation of an erosion and sedimentation control plan, provisions for waste materials and storage, stormwater management measures, and appropriate road maintenance measures. NCDOT's *Best Management Practices for Protection of Surface Waters* and Sedimentation Control guidelines should be strictly enforced during the construction stages of the project.

Due to the potential for water quality impacts during construction, in-stream construction moratoriums to limit the effects on fishery resources have been suggested. The moratorium applies if the following species are supported by the stream: sturgeon (February 1 to June 30), brown and brook trout (October 15 to April 15), rainbow trout (January 1 to April 15), spotfin chub (May 15 to August 15), smallmouth bass (May 1 to July 15), eastern sunfish (April 1 to June 30), western sunfish (May 1 to June 30), and other anadromous fish (February 15 to June 30). A 25 foot (7.6 m) buffer moratorium exists relative to the smallmouth bass. Qualified biologists from the NCDOT will assess the stream for the abovementioned species. Once the fish have been identified as being supported by the stream, the appropriate moratorium will be applied.

Essential fish habitat (EFH) is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The aforementioned waters include aquatic areas and their associated physical, chemical, and biological properties used by fish and include aquatic areas historically used by fish where appropriate. The

**Natural Systems Report  
for B-4135,  
Halifax County**

Physical Resources

aforementioned substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities. The proposed project is not anticipated to involve EFH.

### **3. Biotic Resources**

This section describes the existing vegetation and associated wildlife that occur within the project study area. The project study area is composed of different vegetative communities based on topography, soils, hydrology, and disturbance. These systems are interrelated and in many aspects interdependent. Potential impacts affecting these communities are also discussed. Scientific nomenclature and common name (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism include only the common name.

#### **3.1 Plant Communities**

Community boundaries are frequently ill defined since contiguous communities generally merge without transition zones. Distribution and composition of these communities reflect variations in topography, soils, hydrology, and past and present land uses. Within the study area, all natural community patterns have been modified by previous disturbances. The following community profile description reflects the NCNHP classification scheme. Three plant communities are located in the project study area: cypress-gum swamp (brownwater subtype), mesic mixed hardwood (Coastal Plain subtype), and maintained/disturbed lands. These communities are described in greater detail below and are presented in Figure 2.

##### 3.1.1 Cypress-Gum Swamp (Brownwater Subtype)

Cypress-gum swamps are located throughout the Coastal Plain on large to medium size rivers. This community is seasonally to semipermanently flooded and tends to have periods of sustained high flow in the winter and spring. Soils are generally fine-textured to mucky with sandy soils occurring locally. These communities form stable climaxes, but are slow to recover after disturbances such as logging. This community occurs within and along Cypress Swamp and encompasses approximately 9.87 acres (4.0 hectares).

Cypress-gum swamp communities usually contain vegetation dominated by swamp black gum (*Nyssa aquatica*) and bald cypress (*Taxodium distichum*), with black willow (*Salix nigra*), swamp cottonwood (*Popula heterophylla*), and water hickory (*Carya aquatica*). The understory and herbaceous layer are sparse and may contain Carolina ash (*Fraxinus caroliniana*) and lizard's tail (*Saururus cernuus*) respectively. Herbs such as small-spike false-nettle (*Boehmeris cylindrical*) and partridge berry (*Mitchella repens*) may occur on stumps or logs.

### 3.1.2 Mesic Mixed Hardwood Forest (Coastal Plain Subtype)

The mesic mixed hardwood forest (Coastal Plain subtype) is found throughout the Coastal Plain on upland areas protected from fires. These communities are mainly found on north-facing river bluffs and ravine slopes. The hydrology of this community is terrestrial and mesic with various upland soils and encompasses 2.42 acres (1.0 hectares) in the project study area. The mixed hardwood community occurs as a 50 to 100 foot (15 to 30 meters) wide buffer area bordering the cypress-gum swamp community.

The canopy of the mesic mixed hardwood forest consists of a mixture of mesophytic trees such as American beech (*Fagus grandifolia*), tulip tree (*Liriodendron tulipifera*), white oak (*Quercus alba*), and sweet gum (*Liquidambar styraciflua*). Understory species include flowering dogwood (*Cornus florida*), American holly (*Ilex opaca*), hop hornbeam (*Ostrya virginiana*), red maple (*Acer rubrum*), and sourwood (*Oxydendrum arboreum*). The shrub and herb layers range from sparse to dense. Common shrub species include horse-sugar (*Symplocos tinctoria*), witch-hazel (*Hamamelis virginiana*), giant cane (*Arundinaria gigantea*), and blueberry (*Vaccinium* spp.). Other shrubs include American strawberry-bush (*Euonymus americana*), pepper-bush (*Clethra alnifolia*), and painted buckeye (*Aesculus sylvatica*). Herb species include partridge berry, sedge (*Carex* spp.), and cucumber root (*Medeola virginiana*). Disturbed areas have increased amounts of pines and weedy hardwoods such as tulip tree and sweet gum. These disturbed areas are also susceptible to invasion by exotic species such as a Japanese honeysuckle (*Lonicera japonica*).

### 3.1.3 Maintained/Disturbed Lands

The maintained/disturbed lands community is characterized by human influences and artificial surfaces related to commercial and residential development, roadways, maintained yards, and other areas that have been manipulated. Vegetation associated with this community is kept in a low state of succession by regular mowing, farming, or other maintenance. The project study area is located in a rural residential area and maintained/disturbed lands are present in eastern and western sections of the project study area along SR 1804. This community is present throughout the eastern and western portions of the project study area and encompasses an area of 22.42 acres (9.1 hectares), including approximately 1.07 acre (0.4 hectares) of a manmade pond.

The canopy within the maintained and disturbed lands community is not dominated by any one species due to the sparsely planted shade trees and maintained conditions. The canopy trees include willow oak (*Quercus phellos*), sweet gum, and loblolly pine

(*Pinus taeda*). Fescue (*Festuca* spp.) dominates the groundcover; however, other species such as Japanese honeysuckle could also be found in the groundcover of this community. The agricultural fields that are active and contained remnants of recently harvested cotton are located in the southwestern, northeastern, and southeastern quadrants of the project study area. The maintained/disturbed lands communities include agricultural fields, several private residences, and horse pastureland.

### **3.2 Terrestrial Wildlife**

The cypress-gum swamp and mesic mixed hardwood forest communities, together with disturbed lands, offer good plant diversity and water availability; thus providing high quality wildlife habitat. These communities provide a variety of habitat for amphibians, reptiles, birds, and mammals. Species observed during the site visit are indicated by an asterisk (\*).

The wetland portions of the project study area may be inhabited by various reptiles and amphibians. Amphibians such as the eastern newt (*Notophthalmus viridescens*), spotted salamander (*Ambystoma maculatum*), and mud salamander (*Pseudotriton mantanus*) reside in most any sized naturally wet area and feed predominately on aquatic invertebrates. Other amphibians, such as the southern toad (*Bufo terrestris*) and the green tree frog (*Hyla cinera*) that feed on insects, may also be found in the project area. Reptile species including snakes, lizards, and turtles are found throughout most ecosystems, especially in forested areas near water. Open fields and residential areas are prime habitat for reptiles such as the eastern fence lizard (*Sceloporus undulates*). Other reptiles that may be found in the project area are the Carolina anole (*Anolis carolinensis*) and the southeastern five-line skink (*Eumeces inexpectatus*). Disturbed areas with an abundance of sunlight, such as roadsides, forest edges, fields, and residential areas, are adequate habitat for these species.

Another type of reptile that may be found in the project study area is the snake. Snakes forage on slugs, earthworms, insects, eggs, small mammals, fish, and amphibians depending upon the species. Snake species likely to be present within the project study area include the brown snake (*Soreria dekayi*), redbelly water snake (*Nerodia erythrogaster*), and the rat snake (*Elaphe obsoleta*). The most ancient of all living reptiles are turtles, which are generally omnivorous and found in or near water. Turtle species that are likely to be found within the project study area include the snapping turtle (*Chelydra serpentina*) and eastern box turtle (*Terrapene carolina*).

Bird species inhabiting or migrating through the project study area may include the American robin\* (*Turdus migratorious*), blue jay (*Cyanocitta cristata*), cardinal

(*Cardinalis cardinalis*), tufted titmouse (*Parus bicolor*), rusty blackbird (*Euphagus carolinus*), common grackle (*Quiscalus quiscula*), pileated woodpecker (*Dryocopus pileatus*), brown-headed cowbird (*Molothrus ater*), Carolina wren (*Thryothorus ludovicianus*), belted kingfisher (*Ceryle alcyon*), mourning dove (*Zenaida macroura*), great blue heron (*Ardea herodias*), red bellied woodpecker (*Melanerpes carolinus*), and Northern mockingbird (*Mimus polyglottos*). In general, these birds primarily eat insects in warm weather months and berries or birdseed in winter months. Their nests are above ground and most nests are located in trees or shrubs. Game species such as woodcock (*Scolopax minor*) and wild turkey\* (*Meleagris gallopavo*) may also be present. These game birds all nest on the ground in leaf-lined depressions. The woodcock primarily feeds on earthworms while the ruffed grouse and wild turkey primarily feed on vegetable matter. Predatory birds such as red-tailed hawk (*Buteo jamaicensis*), turkey vulture\* (*Cathartes aura*), and eastern screech owl (*Otus asio*) are likely to be found in the project vicinity. These predatory birds mainly consume rodents and other small animals, and nest above the ground.

A diverse mammal population is expected to be associated with the communities present within the project vicinity. Mammals such as the eastern mole (*Scalopus aquaticus*), meadow vole (*Microtus pennsylvanicus*), and woodland vole (*M. pinetorum*) live below the soil surface in excavated burrows and hibernate underground during the winter. Evidence of burrowing and excavated tunnels underground was observed in the low areas in the project area. Primarily nocturnal mammals such as the Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and muskrat\* (*Ondatra zibethicus*) are also likely to occur in the communities present within the project area. Several of the mammals previously mentioned are seen in disturbed areas; however, few are more comfortable than the gray squirrel (*Sciurus carolinensis*) around areas occupied by humans. In addition, the gray squirrel feeds on acorns and nuts from mast producing trees present within the communities described in the project area. Larger mammals such as the white-tailed deer\* (*Odocoileus virginianus*) will also occur in the project area. Deer are browsers, feed on the leaves and twigs of a wide variety of plants, and are known to inhabit areas that are disturbed by humans. Deer scat were noted during the site visit.

### **3.3 Aquatic Habitats and Wildlife**

The quality and diversity of aquatic habitat in Cypress Swamp is expected to be moderate due agricultural and residential disturbance in the upland areas. Detailed information concerning Cypress Swamp within the project area is included in Section 5.1. A freshwater mussel survey will be conducted by NCDOT.

Golden shiner (*Notemigonus crysoleucas*), bluegill (*Lepomis macrochirus*), pumpkinseed (*L. gibbosus*), mosquitofish (*Gambusia holbrooki*), sawcreek darter (*Etheostoma serrifer*), yellow bullhead (*Ameiurus natalis*), redfin pickeral (*Esox americanus*), bluespotted sunfish (*Enneacanthus gloriosus*), flier (*Centrarchus macropterus*), warmouth (*Lepomis gulosus*), creek chubsucker (*Erimyzon oblongus*), American eel (*Anguilla rostrata*), swampfish (*Chologaster cornulata*), and pirate perch (*Aphredoderus sayanus*) are species that may exist in the waters of Cypress Swamp. These fish feed on a variety of living and organic matter including algae, insects, worms, crustaceans, snails, and detritus.

Other aquatic species likely to be present include several of the previously mentioned amphibian, reptilian, and mammal species. Salamanders, frogs, turtles, and muskrat are a few of the species that inhabit both terrestrial and aquatic communities.

### **3.4 Biotic Resource Impacts**

The impacts to natural communities cannot be estimated at this time since no design alternatives have been identified. In the project study area, the cypress-gum swamp community covers approximately 9.87 acres (4.0 hectares), the mesic mixed hardwood forest community covers approximately 2.42 acres (1.0 hectares), and the maintained/disturbed lands encompass approximately 22.42 acres (9.1 hectares). The remaining acreage in the project study area is covered by surface waters, as described in Section 5.1.

Temporary fluctuations in population of animal species that utilize these communities are anticipated during the course of construction. Slow-moving, burrowing, and/or subterranean organisms will be directly impacted by construction activities, while mobile organisms will be displaced to adjacent communities. Competitive forces in the adapted communities will result in a redefinition of population equilibrium.

Aquatic organisms are acutely sensitive to changes in their environment and environmental impacts from construction activities may result in long term or irreversible effects. Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and impacts adjacent streamside vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and/or feeding mechanisms of benthic organisms, fish, and amphibian species. Siltation may also cover benthic macroinvertebrates with excessive amounts of sediment that inhibit their ability to obtain oxygen. These organisms are slow to recover and usually do not, once the stream has been severely impacted.

The removal of streamside vegetation and placement of fill material during construction enhances erosion and possible sedimentation. Quick revegetation of these areas helps to reduce the impacts by supporting the underlying soils. Erosion and sedimentation may carry soils, toxic compounds, trash, and other materials into the aquatic communities at the construction site. As a result, bars may form at and downstream of the site. Increased light penetration from the removal of streamside vegetation may increase water temperatures. Warmer water contains less oxygen, thus reducing aquatic life that depends on high oxygen concentrations.

#### **4. Waters of the United States**

Section 404 of the CWA requires regulation of discharges into “Waters of the United States.” The United States Environmental Protection Agency (USEPA) is the principal administrative agency of the CWA; however, the United States Army Corps of Engineers (USACE) has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA. The USACE regulatory program is defined in 33 CFR 320-330.

Water bodies, including lakes, rivers, and streams, are subject to jurisdictional consideration under the Section 404 program. Wetlands are also identified as “Waters of the United States.” Wetlands, defined in 33 CFR 328.3, are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Any action that proposes to place fill into these areas falls under the jurisdiction of the USACE under Section 404 of the CWA (33 U.S.C. 1344).

##### **4.1 Surface Waters**

The NCDWQ defines a perennial stream as a clearly defined channel that contains water for the majority of the year. These channels usually have some or all of the following characteristics: distinctive streambed and bank, aquatic life, and groundwater flow or discharge. One perennial stream was identified in the project area as an unnamed tributary to Cypress Swamp.

Cypress Swamp does not have a defined channel. However, aquatic life and groundwater flow or discharge is present, thus Cypress Swamp is classified as jurisdictional waters by the USACE and NCDWQ. At the time of the site visit, Cypress Swamp had a thin layer of ice. The ice made it difficult to determine the rate of flow and the depth of water. Cypress Swamp exhibited good clarity, although the water was stained brown. Leaf litter was abundant on the bed of the swamp.

An unnamed tributary one (UT1) is located in the northwestern portion of the project study area. The stream channel begins at the discharge of the manmade pond and flows, approximately 350 feet (107 meters), until the channel form and pattern is lost into Cypress Swamp. Approximately 50 feet (15 meters) of UT1 is located within the project study area. The stream had a depth on 0.5 to 1.5 feet (0.2 to 0.5 meters), a bank height of 1 to 4 feet (0.3 to 1.2 meters), and a width of approximately 5 to 8 feet (1.5 to

2.4 meters). The bed is comprised of silty substrate and leaf litter, and a slow flow was observed. The water was clear, but brownish in color.

A manmade pond is located in the northwestern portion of the project study area. This pond is maintained by a manmade dam located northwest of the bridge on SR 1804. The pond is an impoundment of the waters of the unnamed tributary to Cypress Swamp. The water that flows through the discharge pipes of the pond forms UT1 and eventually flows into Cypress Swamp. The pond covers approximately 1.1 acres (0.5 hectares) of the study project area. The pond is approximately 440 feet (134 meters) in length and 80 feet (24 meters) in width. The field investigators were not able to see the bottom of the pond; however, the depth is estimated to be greater than 8 feet (2.4 meters). Cypress Swamp, the manmade pond, and the unnamed tributary are classified as jurisdictional waters.

#### **4.2 Jurisdictional Wetlands**

Investigation of wetland occurrence in the project impact area was conducted using methods outlined in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987). One jurisdictional wetland was noted within the project study area. The wetland is riverine and related to Cypress Swamp, and its USFWS classification is PFO1C and PFO1/2F (Cowardin, 1979). The wetland area is located in the central portion of the project study area, comprises approximately 9.27 acres (3.75 hectares), and continues beyond the project study limits to the north and south.

The wetland contains a cypress-gum swamp community and the hydrology is associated with the waters of Cypress Swamp. The overstory vegetation is dominated by bald cypress and black gum, and includes sycamore (*Platanus occidentalis*). The understory contains red maple, Japanese honeysuckle, greenbrier (*Smilax* spp.), and holly (*Ilex* spp.). Water was within 10 inches (25 centimeters) of the surface at the time of the field investigation. Soil texture is that of silty clay loam in the A horizon, silt loam in the B1 horizon, and sandy clay loam in the B2 horizon. The A horizon is approximately 2 inches (5 centimeters) thick with a matrix color of 10YR 4/2 and many fine roots and oxidized root channels. The B1 horizon is 2 to 10 inches deep (5 to 25 centimeters) with a matrix color of 10YR 4/2 and many, distinct, fine mottles with a color of 7.5YR 5/8. The B1 horizon has few, fine roots present. The B2 horizon starts at 10 inches (25 centimeters) below the surface with a matrix color of 10YR 5/1 and many, distinct, medium mottles with color 5YR 5/8. The delineated wetland area encompasses 9.27 acres (3.75 hectares). The wetland data forms and the wetland rating forms are located in Appendix A and Appendix B, respectively.

The upland plot is located approximately 25 feet (10.7 meters) upslope from the southwestern wetland area and approximately 3 feet (1 meter) higher than the wetland area. The vegetation consists of American beech, sweet gum, holly, privet (*Ligustrum sinense*), greenbrier, and giant cane. Soil texture is sandier than the wetland area with sandy texture in both the A and B horizons; however, some organic matter is mixed in the A horizon. The A horizon is approximately 2 inches (5 centimeters) thick with a matrix color of 7.5YR 3/4 with no mottles. The B horizon is at least 10 inches (25 centimeters) thick with a matrix color of 10YR6/8.

#### **4.3 Impacts to Waters of the United States**

Since no alternatives have been selected, impacts to “Waters of the United States” cannot be determined. However, project construction will likely infringe on jurisdictional surface waters through bridge abutments and channel stabilization. Anticipated impacts to “Water of the United States” fall under the jurisdiction of the USACE. Project construction may also impact jurisdictional wetlands, although these impacts will not be known until alternatives have been identified.

Bridge demolition activities associated with this project will strictly follow the NCDOT’s “*Best Management Practices for Bridge Demolition and Removal*.” As per the BMPs-BDR, all methods for demolition shall be considered and implemented where practical, other than dropping the bridge in the water. Information regarding the existing bridge structure and the potential amount of fill from demolition activities is not available at this time and will be supplied by NCDOT in the CE document for the project.

During replacement of the bridge, construction of an onsite temporary detour bridge, use of existing roadways for an off-site detour, or construction of an offsite temporary detour bridge will be required. Approximately 9.72 acres (3.75 hectares) of riverine wetlands are located within the floodplain of Cypress Swamp. Additionally, a manmade pond and an unnamed tributary to Cypress Swamp are located in the northwestern portion of the site. If an off-site detour is not feasible and an onsite temporary bridge is necessary, the detour will be designed such that impact to the manmade pond and unnamed tributary to Cypress Swamp will not occur. If an onsite temporary detour crosses the riverine wetlands, a geotechnical investigation of the wetland substrate’s consolidation potential will have to be performed. Construction of a temporary detour bridge within the wetland area will potentially degrade the ability of the wetland to function as well as it did before extreme compaction or distortion of the substrate occurred from the weight of the bridge.

The existing causeway is comprised of compacted soils and is abutted by wetlands to the north and south. The causeway extends beyond the wetlands associated with the floodplain of Cypress Swamp. Removal of sections of the existing causeway, thereby lengthening the bridge, has the potential to impact abutting wetlands. Based on the width of the stream channel relative to the existing causeway, lengthening the bridge will not improve surface flows.

#### **4.4 Permit Requirements**

Impacts to “Waters of the United States” come under the jurisdiction of the USACE. The Nationwide Permit #23 (Approved Categorical Exclusions) should cover the impacts to jurisdictional streams in the project study area. Nationwide Permit #33 (Temporary Construction, Access, and Dewatering) may be needed for temporary construction access if that is not addressed in National Environmental Policy Act (NEPA) document. A final permitting strategy cannot be developed until a design alternative is selected.

A Section 401 General Water Quality Certification is also required for any activity that may result in a discharge into “Waters of the United States” or for which an issuance of a federal permit or license is issued. Certifications are administered through the NCDWQ.

Final determination of permit applicability lies with the USACE. The NCDOT will coordinate with the USACE after the completion of final design to obtain the necessary permits.

#### **4.5 Mitigation**

The USACE has adopted, through the Council on Environmental Quality (CEQ), a mitigation policy that embraces the concepts of “no net loss of wetlands” and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of “Waters of the United States,” specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoidance of impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR Section 1508.20). Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered in sequential order.

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to “Waters of the United States.” According to a 1990 Memorandum of

Agreement (MOE) between the USEPA and the USACE, in determining “appropriate and practicable” measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes. Some unavoidable impacts to surface waters and one jurisdictional wetland will result from project construction.

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to “Waters of the United States.” Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, right-of-way widths, fill slopes, and/or road shoulder widths. The following other methods are suggested to minimize adverse impacts to “Waters of the United States”:

1. Strictly enforce Best Management Practices (BMPs) to control sedimentation during project construction.
2. Minimize clearing and grubbing activity.
3. Decrease or eliminate discharges into Cypress Swamp.
4. Reestablish vegetation on exposed areas with judicious pesticide and herbicide management.
5. Minimize “in-stream” activity.
6. Use responsible litter control practices.

Compensatory mitigation is not normally considered until anticipated impacts to “Waters of the United States” have been avoided and minimized to the maximum extent possible. It is recognized that “no net loss of wetlands” functions and values may not be achieved in each and every permit action. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts that remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration, creation, and enhancement of “Waters of the United States,” specifically wetlands. Such action should be undertaken in areas adjacent to or contiguous to the discharge site.

Nationwide Permits usually do not require mitigation according to the MOE between the USEPA and the USACE. However, final mitigation requirements are determined by the USACE.

## 5. Rare and Protected Species

Some populations of fauna and flora have been, or are, in the process of decline due to either natural forces or their inability to coexist with humans. Federal law (under the provisions of Section 7 of the Endangered Species Act of 1973, as amended) requires that any action likely to adversely affect a species classified as federally protected be subject to review by the USFWS. Other species may receive additional protection under separate laws. As of February 18, 2003, the USFWS identified three Endangered (E) and one Threatened (T) species as potentially occurring in Halifax County. Table 1 lists these federally protected species and their status. Descriptions of these species and their habitats are discussed below.

**Table 3  
Federally Protected Species Known from Halifax County, North Carolina**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Federal Status</b>	<b>State Status</b>
<b>Vertebrates</b>			
<i>Haliaeetus leucocephalus</i>	Bald eagle	T	T
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	E
<b>Invertebrates</b>			
<i>Alasmidonta heterodon</i>	Dwarf wedge mussel	E	E
<i>Elliptio steinstansana</i>	Tar spiny mussel	E	E

Notes: E - Endangered; T- Threatened

### 5.1 Vertebrates

#### **Bald eagle (*Haliaeetus leucocephalus*)**

Federal: THREATENED - proposed delisted

State: THREATENED

The mature bald eagle (usually 4+ years in age) can be identified by its large white head and short white tail. The body plumage is dark-brown to chocolate-brown in color. Bald eagles can easily be distinguished from other birds by their flat wing soar. They are primarily associated with large bodies of water where food is plentiful. Eagle nests are found in close proximity to water (usually within 0.5 mile (0.8 km)) with a clear flight path to the water, in the largest living tree in an area, with an open view of the surrounding land. Human disturbance can cause nest abandonment. The breeding

season for the bald eagle begins in December and January. Fish are the major food source, although forage items include coots, herons, wounded ducks, and carrion.

As of July 6, 1999, this species is currently under consideration by the USFWS for a proposed de-listing of their threatened status. However, this raptor will still be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, and populations will continue to be monitored for at least another five years under provisions of the Endangered Species Act.

Biological Conclusion: *No Effect*

Suitable habitat for the bald eagle consisting of large bodies of water does not exist within the project area. In addition, there is a large amount of human disturbance around the project study area. Review of NCNHP maps indicated no known populations of this species within one mile of the project study area. No impacts to this species from project construction are anticipated.

#### **Red-cockaded Woodpecker (*Picoides borealis*)**

Federal Status: ENDANGERED

State Status: ENDANGERED

The red-cockaded woodpecker (RCW) is found in pine forest in the southeastern United States. The RCW is unique compared to other woodpeckers because it nests exclusively in living pine trees. It is identified by plumage that is entirely black and white except for small red streaks on the sides of the nape of the male. The back of the RCW is black and white with horizontal stripes. The breast and underside of the woodpecker are white with streaked flanks. The RCW has a large white cheek patch surrounded by a black cap, nape, and throat.

The RCW uses open old growth stands of southern pines, particularly longleaf pine (*Pinus palustris*) for foraging and nesting habitat. If longleaf pines are not present, the RCW will occasionally use slash pine (*Pinus elliotti*), pond pine (*Pinus serotina*), or loblolly pine. A forested stand should contain at least 50 percent pine, lack a thick understory, and be contiguous with other stands to be appropriate for the RCW. It forages mainly on insects including ants, beetles, wood-boring insects, caterpillars, and corn ear worms, if available. RCWs nest exclusively in trees that are generally older than 60 years and contiguous with pine stands at least 30 years of age. The foraging range of the RCW may extend to 500 acres (200 hectares).

Since the RCW nests exclusively in living pines, trees infected with red-heart disease (*Fomes pini*) are often selected for cavity excavation because the inner heartwood is usually weakened. Cavities are located in colonies from 12 to 100 feet (3.6 to 30.3 meters) above ground level and below live branches. The nests can be identified by a large encrustation of running sap that surrounds the tree. The RCW lays its eggs in April, May, and June; the eggs hatch approximately 38 days later.

The RCW was described by Audubon as being abundant in 1839, but it received little study until around 1970, when investigations began to indicate that the species could be headed for extinction. The decline is attributed primarily to the reduction of pine forest with old growth trees and to the encroachment of hardwood midstory due to fire suppression.

Biological Conclusion: *No Effect*

Suitable habitat for the red-cockaded woodpecker is not present in the project study area. There are no areas of open or mature pine stands that are the preference of the bird. NCNHP has no records of any known populations of the red-cockaded woodpecker within the project study area. No impacts are anticipated to the RCW because of project construction.

## **5.2 Invertebrates**

### **Dwarf wedge mussel (*Alasmidonta heterodon*)**

Federal Status: ENDANGERED

State Status: ENDANGERED

The dwarf wedge mussel is a relatively small (from 0.9 to 1.8 inches in length) mussel with a subrhomboidal to subtrapezoidal shell. The exterior shell color is greenish-brown with green rays. The interior nacre is bluish to silvery white. This species is unique in the reversed arrangement of its lateral teeth; there are two teeth on the right valve and one on the left. The dwarf wedge mussel had an historic range from New Brunswick, Canada south to the Neuse River in North Carolina. Currently, the range is greatly reduced in the northern portion of the range and fragmented throughout the southern portion. In the project vicinity, populations are known from the Tar and Neuse River basins in North Carolina. This mussel inhabits large rivers to small streams within its range. The preferred substrate is clay banks stabilized with the root systems of trees. Other bed substrates include coarse sands, mixed sand, gravel and

cobble, and very soft silts. The most important feature of their preferred habitat appears to be excellent to good water quality.

Biological Conclusion: *No Effect*

Suitable habitat is not available in Cypress Swamp. NCNHP has no records of any known populations of dwarf wedge mussel within a one-mile (1.6 km) radius of the project area. This mussel has never been found in the Roanoke River watershed. Therefore, this species will not be impacted because of project construction.

**Tar River spiny mussel (*Elliptio steinstansana*)**

Federal Status: ENDANGERED

State Status: ENDANGERED

The Tar River spiny mussel is a small mussel, up to 2.8 inches, with a subrhomboidal shell. It is one of only three freshwater mussels in the world with spines. The juveniles have up to 12 spines and an outer shell of orange-brown with greenish rays; adults tend to lose spines as they mature and their shells are darker with inconspicuous rays. The interior nacre is yellow to pinkish anteriorly and bluish white to iridescent posteriorly. This mussel is endemic to the Tar and Neuse River drainages of the lower Piedmont and upper Coastal Plain of North Carolina. Most populations are known from medium streams to rivers with fast flowing water of the Tar River basin. It lives in silt free, unconsolidated gravel or coarse sand usually in shallow water but will utilize deep water with appropriate substrates.

Biological Conclusion: *No Effect*

Suitable habitat for the Tar River spiny mussel is not present in the project study area. NCNHP has no records of any known populations of the Tar River spiny mussel within a one-mile (1.6 km) radius of the project area. In addition, this mussel has never been found in the Roanoke River watershed. Therefore, this species will not be impacted because of project construction.

**Federal Species of Concern**

There are nine federal species of concern (FSC) listed by the USFWS for Halifax County. These species are not protected under the provisions of Section 7 of the Endangered Species Act. FSC are defined as species under consideration for listing for which there is insufficient information to support listing as threatened or endangered

(formerly C2 candidate species). The status of these species may be upgraded at any time, thus they are included here for consideration. The NCNHP lists of January 2003 included these species and identified an additional twenty-eight species receiving protection under state laws. Protections afforded to species listed under state law are not applicable to this project. Table 2 lists the FSC, their state status, and the existence of suitable habitat within the project area. A review of NCNHP maps depicting known populations of these federal species of concern found no known populations of FSC within a one-mile (1.6-km) radius of the project study area.

**Table 4  
Federal Species of Concern Known from Halifax County, North Carolina**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Federal Status</b>	<b>State Status</b>	<b>Habitat Requirements</b>	<b>Habitat Available</b>
<b>Vertebrates</b>					
Bachman' sparrow	<i>Aimophila aestivalis</i>	FSC	SC	Scrubby vegetation and a dense herbaceous understory, grassy glades and pine savannas. <sup>1</sup>	No
"Carolina" madtom	<i>Noturus furiosus</i> population 1	FSC	SR	Tar River drainages	
Cerulean warbler	<i>Dendroica cerulea</i>	FSC	SR	Mature hardwood forests with an open understory.	Yes
<b>Invertebrates</b>					
Atlantic pigtoe	<i>Fusconaia masoni</i>	FSC	E	Relatively fast waters of high quality rivers or large creeks; typically found in headwaters or rural watersheds.	No
Chowanoke crayfish	<i>Orconectes virginienis</i>	FSC	SC	Sluggish streams or swamps on sand or gravel substrates. <sup>2</sup>	Yes
Tar River crayfish	<i>Procambarus medialis</i>	FSC	*	Ditches with very slow to no flow and sandy mud bottoms.	No
Yellow lampmussel	<i>Lampsilis cariosa</i>	FSC	E	Larger streams and rivers in sand and gravel with good current.	No
Yellow lance	<i>Elliptio lanceolata</i>	FSC	E	Sandy substrates, rocks, mud, and slack water areas of medium-sized rivers.	No
<b>Plants</b>					
Bog St. John's-wort	<i>Hypericum adpressum</i>	FSC	SR-T	Wetlands, usually along shores and ponds with fluctuating water tables.	Yes
Carolina least trillium	<i>Trillium pusillum</i> var. <i>pusillum</i>	FSC	E	Ecotones between savannas and nonriverine wet hardwood forests.	No

Status: E – Endangered; T – Threatened; FSC - Federal Species of Concern;  
SC - State Species of Concern; SR - State Significantly Rare;  
SR-T – Significantly Rare Throughout North Carolina.

\*Watch List Species (Clamp, 1999)

<sup>1</sup> (Bessken, 2000)

<sup>2</sup> (NHP-ICAS, 1999)

## **6. References**

- Anderson, D.T. and C.D. Cole, 2001. Soil Survey of Halifax County. Natural Resources Conservation Service, United States Department of Agriculture.
- Cowardin, L. M., V. Carter, F. C. Golet and E. T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitat of the United States. Fish and Wildlife Service, U.S. Department of the Interior.
- Environmental Laboratory, 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. 100 pp. + appendices.
- Gregory, J.D. 2001. Hydric Soils and Growing Season: Wetland Delineation Data for North Carolina. Department of Forestry, NC State University, Raleigh, NC.
- Martof, B. S., Palmer, W. M., Bailey, J. R., and J. R. Harrison III, 1980. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press, Chapel Hill, NC. 264 pp.
- Natural Heritage Program (NHP) Invertebrate Characterization Abstracts (State of North Carolina) (ICAS). 1999. Printed from the Biological Conservation Database.
- North Carolina Division of Water Quality (DWQ), Department of Environment and Natural Resources, 1995. Guidance for Rating the Values of Wetlands in North Carolina. Raleigh, NC.
- North Carolina Geological Survey (NCGS), 1991. Geologic Map of North Carolina. Printed 1991, reprinted 1996.
- North Carolina Natural Heritage Program (NCNHP), 2003. Element Occurrence List for Halifax County, North Carolina. North Carolina Division of Parks and Recreation, Raleigh, NC.
- Radford, A. E., Ahles, H. E., and C. R. Bell, 1968. Manual of the Vascular Flora of the Carolinas. The University of North Carolina Press, Chapel Hill, NC. 1183 pp.

- Rohde, F. C., R. G. Arndt, D. G. Lindquist, and J. P. Parnell, 1994. Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware. The University of North Carolina Press, Chapel Hill, NC.
- Schafale, M. P. and A. S. Weakley, 1990. Classification of the Natural Communities of North Carolina, A Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, Department of Environment, Health and Natural Resources, Raleigh, NC.
- United States Fish and Wildlife Service, 2003. Halifax County Endangered Species, Threatened Species, and Federal Species of Concern. United States Department of Interior.
- Webster, W. D., Parnell, J. F., and W. C. Biggs, 1985. Mammals of the Carolinas, Virginia, and Maryland. The University of North Carolina Press, Chapel Hill, NC. 255 pp.

**Natural Systems Report  
for B-4135,  
Halifax County**

Figures

## **Appendix A**

Wetland Data Forms

**Appendix B**

Wetland Rating Forms

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Replacement of Bridge No. 72 over Cypress Swamp (TIP B-4135)</u> Applicant/Owner: <u>NCDOT</u> Investigator(s): <u>Layna Thrush, Kim Matthews</u>	Date: <u>January 28, 2003</u> County: <u>Halifax</u> State: <u>North Carolina</u> Community II: <u>Wetland</u> Transect ID: _____ Plot ID: _____
Do Normal Circumstances exist on the site? <input type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is this area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse)	

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Taxodium distichum</u>	<u>tree</u>	<u>OBL</u>	9. _____	_____	_____
2. <u>Nyssa aquatica</u>	<u>tree</u>	<u>OBL</u>	10. _____	_____	_____
3. <u>Platanus occidentalis</u>	<u>tree</u>	<u>FACW</u>	11. _____	_____	_____
4. <u>Acer rubrum</u>	<u>understory</u>	<u>FACW</u>	12. _____	_____	_____
5. <u>Ilex spp.</u>	<u>understory</u>	_____	13. _____	_____	_____
6. <u>Lonicera japonica</u>	<u>vine</u>	<u>FAC-</u>	14. _____	_____	_____
7. <u>Smilax spp.</u>	<u>vine</u>	<u>FAC</u>	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). \_\_\_\_\_

Remarks: *dominated by Taxodium distichum and Nyssa aquatic, especially in undisturbed areas.*

**HYDROLOGY**

<p>____ Recorded Data (Describe in Remarks)</p> <p>    ____ Stream, Lake, or tide Gauge</p> <p>    ____ Aerial Photographs</p> <p>    ____ Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p><b>Wetland Hydrology Indicators:</b></p> <p><b>Primary Indicators:</b></p> <p>    ____ Inundated</p> <p>    <input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>    ____ Water Marks</p> <p>    ____ Drift Lines</p> <p>    ____ Sediment Deposits</p> <p>    ____ Drainage Patterns in Wetlands</p> <p><b>Secondary Indicators (2 or more required):</b></p> <p>    <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p>    ____ Water-Stained Leaves</p> <p>    <input checked="" type="checkbox"/> Local Soil Survey Data</p> <p>    ____ FAC-Neutral Test</p> <p>    ____ Other (Explain in Remarks)</p>
<p><b>Field Observations:</b></p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>10</u> (in.)</p>	

Remarks: *Wetland area contiguous with Cypress swamp.*



**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Replacement of Bridge No. 72 over Cypress Swamp (TIP B-4135)</u> Applicant/Owner: <u>NCDOT</u> Investigator(s): <u>Layna Thrush, Kim Matthews</u>	Date: <u>January 28, 2003</u> County: <u>Halifax</u> State: <u>North Carolina</u>
Do Normal Circumstances exist on the site? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is this area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -(If needed, explain on reverse)	Community II: <u>Upland</u> Transect ID: _____ Plot ID: _____

**VEGETATION**

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	<u>Fagus grandifolia</u>	<u>tree</u>	<u>FACU</u>	9.	_____	_____	_____
2.	<u>Liquidambar styraciflua</u>	<u>tree</u>	<u>FAC+</u>	10.	_____	_____	_____
3.	<u>Ilex spp.</u>	<u>shrub</u>	_____	11.	_____	_____	_____
4.	<u>Smilax spp.</u>	<u>vine</u>	<u>FAC</u>	12.	_____	_____	_____
5.	<u>Ligustrum sinense</u>	<u>shrub</u>	<u>FAC</u>	13.	_____	_____	_____
6.	<u>Arundinaria gigantea</u>	<u>herb</u>	<u>FACW</u>	14.	_____	_____	_____
7.	_____	_____	_____	15.	_____	_____	_____
8.	_____	_____	_____	16.	_____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). \_\_\_\_\_

Remarks:

**HYDROLOGY**

Recorded Data (Describe in Remarks) <input type="checkbox"/> Stream, Lake, or tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations:</b>  Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	

Remarks: *Break between upland and wetland occurs sharply at break in slope; distinct.*

**SOILS**

Map Unit Name (Series and Phase): State fine sandy loam Drainage Class: Well drained  
 Taxonomy (Subgroup) Typic Hapludult Field Observations Confirm Mapped Type? Yes  No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	A	7.5R3/4			sandy/organic
- 2+	B	10YR6/8			sandy

Hydric Soil Indicators:

- |  |   |
|--|---|
| <input type="checkbox"/> Histosol                    | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon             | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor               | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime       | <input type="checkbox"/> Listed on Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions         | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

Remarks: *Soil very sandy and brightly colored.*

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Hydric Soils Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Remarks: *Upland plot was located approximately 25 feet upslope from point WB19.*